

(12) **United States Patent**
Amundson et al.

(10) **Patent No.:** **US 8,876,013 B2**
(45) **Date of Patent:** ***Nov. 4, 2014**

(54) **HVAC CONTROLLER THAT SELECTIVELY REPLACES OPERATING INFORMATION ON A DISPLAY WITH SYSTEM STATUS INFORMATION**

(75) Inventors: **John Amundson**, Minneapolis, MN (US); **Jeffrey Boll**, Brooklyn Park, MN (US)

(73) Assignee: **Honeywell International Inc.**, Morristown, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 537 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/103,924**

(22) Filed: **May 9, 2011**

(65) **Prior Publication Data**

US 2012/0116593 A1 May 10, 2012

Related U.S. Application Data

(63) Continuation of application No. 12/323,179, filed on Nov. 25, 2008, now Pat. No. 8,091,796.

(60) Provisional application No. 60/991,626, filed on Nov. 30, 2007.

(51) **Int. Cl.**
G05D 23/00 (2006.01)
G05B 11/01 (2006.01)
G05B 15/00 (2006.01)
G01M 1/38 (2006.01)
G05B 13/02 (2006.01)
G05D 23/19 (2006.01)
F24F 11/00 (2006.01)

(52) **U.S. Cl.**
CPC **G05B 13/02** (2013.01); **G05D 23/1902** (2013.01); **F24F 11/0086** (2013.01); **F24F 2011/0064** (2013.01)
USPC **236/94**; 700/17; 700/83; 700/276

(58) **Field of Classification Search**
USPC 236/51, 94, 47; 165/201; 700/17, 83, 700/276, 277, 278

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,079,366 A 3/1978 Wong
4,174,807 A 11/1979 Smith et al.
(Continued)

FOREIGN PATENT DOCUMENTS

DE 3334117 4/1985
EP 0070414 1/1983
(Continued)

OTHER PUBLICATIONS

“CorAccess Systems/In Home,” <http://web.archive.org/web/20011212084427/www.coraccess.com/home.html>, 1 page, copyright 2001, printed Aug. 19, 2004.

(Continued)

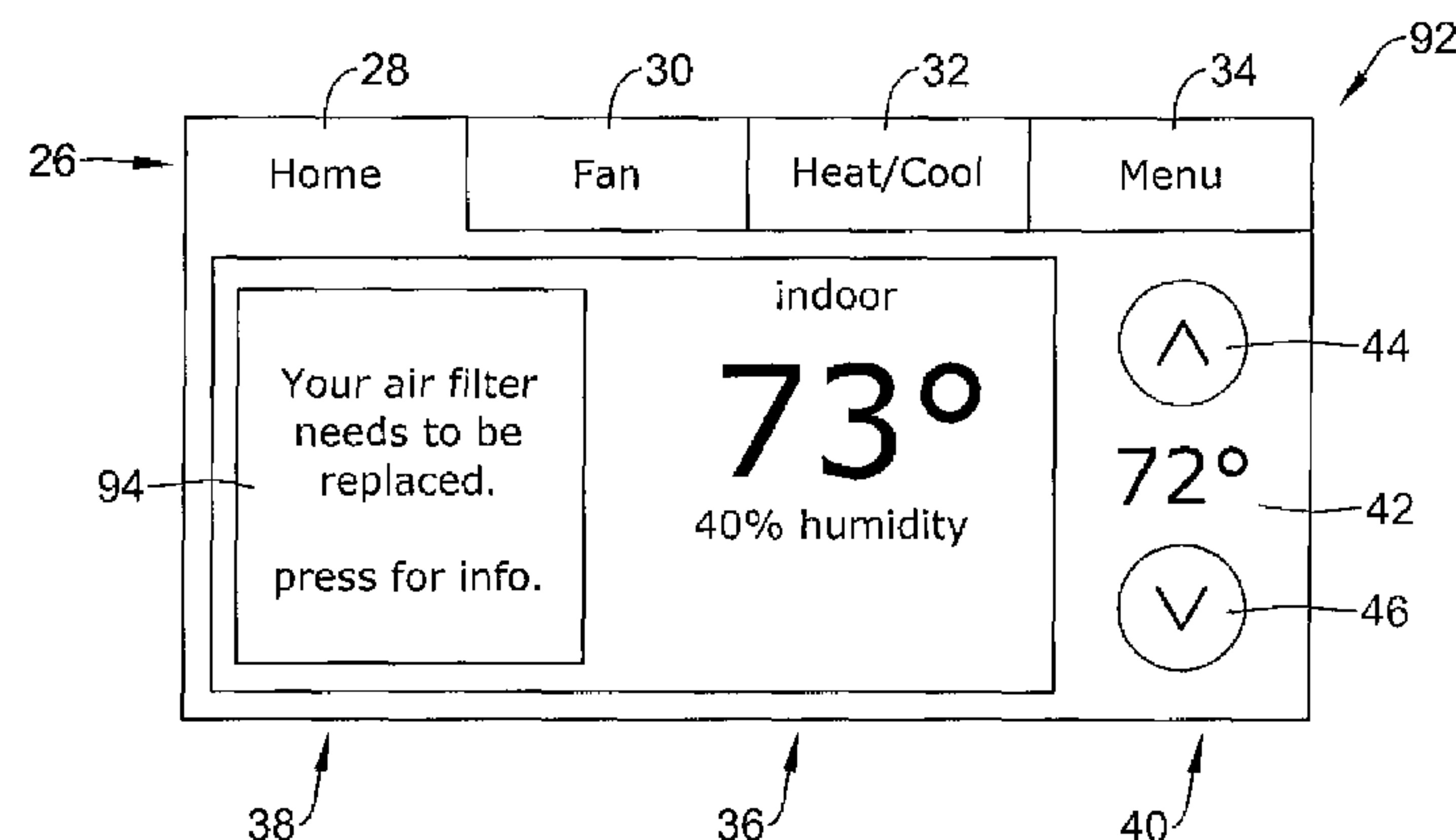
Primary Examiner — Chen Wen Jiang

(74) *Attorney, Agent, or Firm* — Seager Tufte & Wickhem LLC.

(57) **ABSTRACT**

An HVAC controller is described that is configured to be more intuitive and user friendly to program and operate than convention HVAC controllers. In some instances, the HVAC controller may include a touch screen interface that provides greater flexibility in displaying information to the user and/or soliciting information from the user.

23 Claims, 100 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

4,206,872 A	6/1980	Levine	6,020,881 A	2/2000	Naughton et al.
4,224,615 A	9/1980	Penz	6,032,867 A	3/2000	Dushane et al.
4,264,034 A	4/1981	Hyltin et al.	6,059,195 A	5/2000	Adams et al.
4,296,334 A	10/1981	Wong	6,081,197 A	6/2000	Garrick et al.
4,298,946 A	11/1981	Hartsell et al.	6,101,824 A	8/2000	Meyer et al.
4,308,991 A	1/1982	Peinetti et al.	6,104,963 A	8/2000	Cebasek et al.
4,332,352 A	6/1982	Jaeger	6,119,125 A	9/2000	Gloudeman et al.
4,337,822 A	7/1982	Hyltin et al.	6,121,875 A	9/2000	Hamm et al.
4,337,893 A	7/1982	Flanders et al.	6,140,987 A	10/2000	Stein et al.
4,373,664 A	2/1983	Barker et al.	6,141,595 A	10/2000	Gloudeman et al.
4,379,483 A	4/1983	Farley	6,149,065 A	11/2000	White et al.
4,382,544 A	5/1983	Stewart	6,154,681 A	11/2000	Drees et al.
4,386,649 A	6/1983	Hines et al.	6,167,316 A	12/2000	Gloudeman et al.
4,388,692 A	6/1983	Jones et al.	6,192,282 B1	2/2001	Smith et al.
4,431,134 A	2/1984	Hendricks et al.	6,196,467 B1	3/2001	Dushane et al.
4,442,972 A	4/1984	Sahay et al.	6,208,331 B1	3/2001	Singh et al.
4,446,913 A	5/1984	Krocker	6,216,956 B1	4/2001	Ehlers et al.
4,479,604 A	10/1984	Didner	6,236,326 B1	5/2001	Murphy
4,503,471 A	3/1985	Hanajima et al.	6,259,074 B1	7/2001	Brunner et al.
4,506,827 A	3/1985	Jamieson et al.	6,285,912 B1	9/2001	Ellison et al.
4,556,169 A	12/1985	Zervos	6,290,140 B1	9/2001	Pesko et al.
4,606,401 A	8/1986	Levine et al.	6,315,211 B1	11/2001	Sartain et al.
4,621,336 A	11/1986	Brown	6,318,639 B1	11/2001	Toth
4,622,544 A	11/1986	Bially et al.	6,330,806 B1	12/2001	Beaverson et al.
4,628,201 A	12/1986	Schmitt	6,344,861 B1	2/2002	Naughton et al.
4,646,964 A	3/1987	Parker et al.	6,351,693 B1	2/2002	Monie et al.
4,717,333 A	1/1988	Carignan	6,398,118 B1	6/2002	Rosen et al.
4,725,001 A	2/1988	Carney et al.	6,453,687 B2	9/2002	Sharood et al.
4,837,731 A	6/1989	Levine et al.	6,466,132 B1	10/2002	Caronna et al.
4,881,686 A	11/1989	Mehta	6,478,233 B1	11/2002	Shah
4,918,439 A	4/1990	Wozniak et al.	6,502,758 B2	1/2003	Cottrell
4,948,040 A	8/1990	Kobayashi et al.	6,518,953 B1	2/2003	Armstrong
4,992,779 A	2/1991	Sugino et al.	6,518,957 B1	2/2003	Lehtinen et al.
4,997,029 A	3/1991	Otsuka et al.	6,546,419 B1	4/2003	Humpleman et al.
5,005,365 A	4/1991	Lynch	6,556,899 B1	4/2003	Harvey et al.
5,012,973 A	5/1991	Dick et al.	6,574,537 B2	6/2003	Kipersztok et al.
5,038,851 A	8/1991	Mehta	6,578,770 B1	6/2003	Rosen
5,053,752 A	10/1991	Epstein et al.	6,580,950 B1	6/2003	Johnson et al.
5,065,813 A	11/1991	Berkeley et al.	6,581,846 B1	6/2003	Rosen
5,086,385 A	2/1992	Launey et al.	6,595,430 B1	7/2003	Shah
5,088,645 A	2/1992	Bell	6,608,560 B2	8/2003	Abrams
5,140,310 A	8/1992	DeLuca et al.	6,619,555 B2	9/2003	Rosen
5,161,606 A	11/1992	Berkeley et al.	6,621,507 B1	9/2003	Shah
5,170,935 A	12/1992	Federspiel et al.	6,663,010 B2	12/2003	Chene et al.
5,172,565 A	12/1992	Wruck et al.	6,685,098 B2	2/2004	Okano et al.
5,181,653 A	1/1993	Foster et al.	6,726,112 B1	4/2004	Ho
5,187,797 A	2/1993	Nielsen et al.	6,783,079 B2	8/2004	Carey et al.
5,230,482 A	7/1993	Ratz et al.	6,786,421 B2	9/2004	Rosen
5,238,184 A	8/1993	Adams	6,789,739 B2	9/2004	Rosen
5,251,813 A	10/1993	Kniepkamp	6,801,849 B2	10/2004	Szukala et al.
5,259,445 A	11/1993	Pratt et al.	6,824,069 B2	11/2004	Rosen
5,329,991 A	7/1994	Mehta et al.	6,833,990 B2	12/2004	LaCroix et al.
5,348,078 A	9/1994	Dushane et al.	6,842,721 B2	1/2005	Kim et al.
5,386,577 A	1/1995	Zenda	6,868,293 B1	3/2005	Schurr et al.
5,404,934 A	4/1995	Carlson et al.	6,973,410 B2	12/2005	Seigel
5,414,618 A	5/1995	Mock et al.	7,001,495 B2	2/2006	Essalik et al.
5,482,209 A	1/1996	Cochran et al.	7,047,092 B2 *	5/2006	Wimsatt 700/83
5,526,422 A	6/1996	Keen	7,050,026 B1	5/2006	Rosen
5,537,106 A	7/1996	Mitsuhashi	7,055,759 B2	6/2006	Wacker et al.
5,566,879 A	10/1996	Longtin	7,083,109 B2	8/2006	Pouchak
5,570,837 A	11/1996	Brown et al.	7,146,253 B2	12/2006	Hoog et al.
5,673,850 A	10/1997	Uptegraph	7,152,806 B1	12/2006	Rosen
5,682,206 A	10/1997	Wehmeyer et al.	7,156,318 B1	1/2007	Rosen
5,732,691 A	3/1998	Maiello et al.	7,225,054 B2	5/2007	Amundson et al.
5,782,296 A	7/1998	Mehta	7,232,075 B1	6/2007	Rosen
5,818,428 A	10/1998	Eisenbrandt et al.	7,240,289 B2	7/2007	Naughton et al.
5,873,519 A	2/1999	Beilfuss	7,302,642 B2	11/2007	Smith et al.
5,886,697 A	3/1999	Naughton et al.	7,505,914 B2	3/2009	McCall
5,901,183 A	5/1999	Garin et al.	7,542,867 B2	6/2009	Steger et al.
5,902,183 A	5/1999	D'Souza	8,091,796 B2 *	1/2012	Amundson et al. 236/94
5,915,473 A	6/1999	Ganesh et al.	2001/0029585 A1	10/2001	Simon et al.
5,937,942 A	8/1999	Bias et al.	2001/0052459 A1	12/2001	Essalik et al.
5,947,372 A	9/1999	Tiernan	2002/0011923 A1	1/2002	Cunningham et al.
5,950,709 A	9/1999	Krueger et al.	2002/0022991 A1	2/2002	Sharood et al.
6,009,355 A	12/1999	Obradovich et al.	2002/0092779 A1	7/2002	Essalik et al.
			2003/0033230 A1	2/2003	McCall
			2003/0034897 A1	2/2003	Shamoon et al.
			2003/0034898 A1	2/2003	Shamoon et al.
			2003/0177012 A1	9/2003	Drennan

(56)

References Cited**U.S. PATENT DOCUMENTS**

2004/0245352 A1* 12/2004 Smith 236/94
 2004/0262410 A1 12/2004 Hull
 2005/0119794 A1* 6/2005 Amundson et al. 700/276
 2007/0228183 A1* 10/2007 Kennedy et al. 236/1 C
 2009/0140062 A1 6/2009 Amundson et al.

FOREIGN PATENT DOCUMENTS

EP 0434926 8/1995
 EP 0678204 3/2000
 EP 0985994 3/2000
 EP 1033641 9/2000
 EP 1074009 3/2002
 FR 2711230 4/1995
 WO WO 97/11448 3/1997
 WO WO 97/39392 10/1997
 WO WO 00/43870 7/2000
 WO WO 01/52515 7/2001
 WO WO 01/79952 10/2001

OTHER PUBLICATIONS

“HAI Company Background,” http://www.homeauto.com/AboutHAI/abouthai_main.htm, 2 pages, printed Aug. 19, 2004.
 “High-tech options take hold in new homes—200-08-28—Dallas Business Journal,” <http://bizjournals.com/dallas/stories/2000/08/28/focus4>, 3 pages, dated Aug. 28, 2000, printed Aug. 19, 2004.
 “Home Toys Review—TouchLinc,” <http://www.hometoys.com/htinews/aug99/reviews/touchlinc/touchlinc.htm>, 3 pages, dated Aug. 1999, printed Aug. 20, 2004.
 “HTI News Release,” <http://www.hometoys.com/htinews/apr99/releases/ha101.htm>, 3 pages, Apr. 1999.
 “Mark of Excellence Award Finalist Announced,” <http://64.233.167.104/search?Q=cache:ciOA2YtYaBIJ:www.hometoys.com/releases/mar...>, 6 pages, Leopard Touchscreen on p. 2, dated prior to Mar. 4, 2000, printed Aug. 20, 2004.
 “Product Review—Philips Pronto Remote Control,” http://hometheaterhifi.com/volume_6_2/philipsprontoremotecontrol.html, 5 pages, dated May 1999, printed Aug. 20, 2004.
 “RC X10 Automation Forum: Control your Heating and Cooling System with Pronto(1/1),” <http://www.remotecentral.com/cgi-bin/mboard/rc-x10/thread.cgi?12>, 2 pages, dated Apr. 23, 1999, printed Aug. 20, 2004.
 “Spotlight on integrated systems,” Custom Builder, V8, N2, p. 66(6), Mar.-Apr. 1993.
 “Vantage Expands Controls for Audio/Video, HVAC and Security,” <http://www.hometoys.com/htinews/aug99/releases/vantage03.htm>, 2 pages, dated Aug. 3, 1999, printed Aug. 20, 2004.
 ADI, “Leopard User Manual,” 93 pages, 2001.
 Adicon 2500, “The Automator,” 4 pages, Oct.-Dec. 2000.
 ADT Security Services, “iCenter Advanced User Interface 8142ADT,” Installation and Setup Guide, 4 pages, May 2001; First Sale Feb. 2001.
 Aprilaire Electronic Thermostats Models 8344, 8346, 8348, 8363, 8365, 8366 Operating Instructions, 8 pages, 2003.
 Aube Technologies, Electronic Thermostat for Heating System Model TH135-01, 5 pages, Aug. 14, 2001.
 Aube Technologies, TH140-28 Electronic Programmable Thermostat, Installation Instructions and User Guide, pp. 1-4, Jan. 22, 2004.
 AutomatedBuildings.com Article—“Thin Client” Solutions, “Pressure, Air Flow, Temperature, Humidity & Valves,” Dwyer Instruments, Inc., 5 pages, printed Sep. 20, 2004.
 Blake et al., “Seng 310 Final Project Demo Program” Illustration, 3 pages, Apr. 6, 2001.
 Blake et al., “Seng 310 Final Project” Report, dated Apr. 6, 2001.
 Blister Pack Insert from a Ritetemp 8082 Touch Screen Thermostat Product, 2 pages, 2002.
 Braeburn Model 3000 Owner’s Manual, pp. 1-13, 2001.
 Braeburn Model 5000 Owners Manual, pp. 1-17, 2001.

BRK Electronics Maximum Protection Plus Ultimate Convenience Smoke Alarm, 24 pages, Sep. 2000.
 BRK First Alert, User’s Manual, Smoke and Fire Alarms, pp. 1-7, Nov. 2002.
 Business Wire, “MicroTouch Specialty Products Group to Capitalize on Growing Market for Low-Cost Digital Matrix Touchscreens,” p1174 (2 pages), Jan. 6, 1999.
 Cardio Manual, available at <http://www.secant.ca/En/Documentation/Cardio2e-Manual.pdf>, Cardio Home Automation Inc., 55 pages, printed Sep. 28, 2004.
 Cardio, by Secant; <http://www.hometoys.com/htinews/apr98/reviews/cardio.htm>, “HTINews Review,” Feb. 1998, 5 pages, printed Sep. 14, 2004.
 Carrier Microelectronic Programmable Thermostat Owner’s Manual, pp. 1-24, May 1994.
 Carrier TSTATCCRF01 Programmable Digital Thermostat, pp. 1-21, prior to Apr. 21, 2005.
 Carrier, “Programmable Dual Fuel Thermostat,” Installation, Start-Up & Operating Instructions, pp. 1-12, Oct. 1998.
 Carrier, “Programmable Thermostats,” Installation, Start-Up & Operating Instructions, pp. 1-16, Sep. 1998.
 Carrier, “Standard Programmable Thermostat,” Homeowner’s Manual, pp. 1-8 pages, 1998.
 Carrier, “Thermostat Control,” Installation, Start-Up, and Operating Instructions, pp. 1-12, Aug. 1999.
 CorAccess, “Companion 6,” User Guide, pp. 1-20, Jun. 17, 2002.
 Danfoss RT51/51RF & RT52/52RF User Instructions, 2 pages, Jun. 2004.
 DeKoven et al., “Designing Collaboration in Consumer Products,” 2 pages, 2001.
 DeKoven et al., “Measuring Task Models in Designing Intelligent Products,” 2 pages, Jan. 13-16, 2002.
 Domotique Secant Home Automation—Web Page, available at <http://www.secant.ca/En/Company/Default.asp>, 1 page, printed Sep. 28, 2004.
 Firex Smoke Alarm, Ionization Models AD, ADC Photoelectric Model Pad, 4 pages, prior to Apr. 21, 2005.
 Freudenthal et al., “Communicating extensive smart home functionality to users of all ages: the design of a mixed-initiative multimodal thermostat-interface,” pp. 34-39, Mar. 12-13, 2001.
 Gentex Corporation, HD135, 135 ° Fixed Temperature Heat Detector AC Pwered, 120V, 60Hz With Battery Backup, Installation Instructions—Owner’s Information, pp. 1-5, Jun. 1, 1998.
 Gentex Corporation, 9000 Series, Photoelectric Type Single Station/Multi-Station Smoke Alarms AC Powered With Battery Backup, Installation Instructions—Owner’s Information, pp. 9-1 to 9-6, Jan. 1, 1993.
 Honeywell Bravis Deluxe Programmable Thermostat, pp. 1-20, 2002.
 Honeywell Bravis T8602C Chronotherm IV Deluxe Programmable Thermostats, Installation Instructions, pp. 1-12, 2002.
 Honeywell CT8602C Professional Fuel Saver Thermostat, pp. 1-6, 1995.
 Honeywell Electronic Programmable Thermostat, Owner’s Guide, pp. 1-20, 2003.
 Honeywell Electronic Programmable Thermostats, Installation Instructions, pp. 1-8, 2003.
 Honeywell News Release, “Honeywell’s New Sysnet Facilities Integration System for Boiler Plant and Combustion Safety Processes,” 4 pages, Dec. 15, 1995.
 Honeywell T8002 Programmable Thermostat, Installation Instructions, pp. 1-8, 2002.
 Honeywell T8602A,B,C,D and TS8602A,C Chronotherm III Fuel Saver Thermostats, Installation Instructions, pp. 1-12, 1995.
 Honeywell T8602D Chronotherm IV Deluxe Programmable Thermostats, Installation Instructions, pp. 1-12, 2002.
 Honeywell TH8000 Series Programmable Thermostats, Owner’s Guide, pp. 1-44, 2004.
 Honeywell, “Introduction of the S7350A Honeywell WebPAD Information Appliance,” Home and Building Control Bulletin, 2 pages, Aug. 29, 2000; Picture of WebPad Device with touch screen, 1 Page; and screen shots of WebPad Device, 4 pages.
 Honeywell, “W7006A Home Controller Gateway User Guide,” 31 pages, Jul. 2001.

(56)

References Cited

OTHER PUBLICATIONS

Honeywell, MagicStat® CT3200 Programmable Thermostat, Installation and Programming Instructions, pp. 1-24, 2001.
http://www.cc.gatech.edu/computing/classes/cs6751_94_fall/groupe/climate-2/node1.html, "Contents," 53 pages, printed Sep. 20, 2004.
http://www.ritetemp.info/rtMenu_13.html, Rite Temp 8082, 8 pages, printed Jun. 20, 2003.
<http://www.thermostatsales.com>, Robertshaw, "9610 Digital Programmable Thermostat," 3 pages, printed Jun. 17, 2004.
<http://www.thermostatsales.com>, Robertshaw, "9700 Deluxe Programmable Thermostat" 3 pages, printed Jun. 17, 2004.
<http://www.thermostatsales.com>, Robertshaw, "9710 Deluxe Programmable Thermostat," 3 pages, printed Jun. 17, 2004.
<http://www.thermostatsales.com>, Robertshaw, "9720 Deluxe Programmable Thermostat," 3 pages, printed Jun. 17, 2004.
 Hunter, "44200/44250," Owner's Manual, 32 pages, prior to Jul. 7, 2004.
 Hunter, "44300/44350," Owner's Manual, 35 pages, prior to Jul. 7, 2004.
 Hunter, "Auto Saver 550", Owner's Manual Model 44550, 44 pages, prior to Jul. 7, 2004.
 Install Guide for Ritetemp Thermostat 8082, 6 pages, 2002.
 Invensys™, "9700i 9701i 9715i 9720i Deluxe Programmable Thermostats," User's Manual, pp. 1-28, prior to Jul. 7, 2004.
 Lux ELV1 Programmable Line Voltage Thermostat, Installation Instructions, 3 pages, prior to Jul. 7, 2004.
 Lux TX500 Series Smart Temp Electronic Thermostat, 3 pages, prior to Jul. 7, 2004.
 Lux TX9000 Installation, 3 pages, prior to Apr. 21, 2005.
 Lux, "511 Series Smart Temp Electronic Thermostat," Owner's Manual, 3 pages, prior to Jul. 7, 2004.
 Lux, "600 Series Smart Temp Electronic Thermostat," Owner's Manual, 3 pages, prior to Jul. 7, 2004.
 Lux, "602 Series Multi-Stage Programmable Thermostat," Owner's Manual, 2 pages, prior to Jul. 7, 2004.
 Lux, "605/2110 Series Programmable Heat Pump Thermostat," Owner's Manual, 3 pages, prior to Jul. 7, 2004.
 Lux, "700/9000 Series Smart Temp Electronic Thermostat," Owner's Manual, 3 pages, prior to Jul. 7, 2004.
 Lux, "PSPH521 Series Programmable Heat Pump Thermostat," Owner's Manual, 3 pages, prior to Jul. 7, 2004.
 Lux, "TX1500 Series Smart Temp Electronic Thermostat," Owner's Manual, 6 pages, prior to Jul. 7, 2004.
 Metasys, "HVAC Pro for Windows User's Manual," 308 pages, 1998.
 Operation Manual for Ritetemp Touch Screen Thermostat 8082, 8 pages, 2002.
 Proliphix, "Web Enabled IP Thermostats, Intelligent HVAC Control," Proliphix Inc., 2 pages, on or before Aug. 28, 2004.
 Proliphix, "Web Enabled IP Thermostats, Ultimate in Energy Efficiency!," Proliphix Inc., 2 pages, on or before Aug. 28, 2004.
 Proliphix, Inc., "NT10e & NT20e," 54 pages, on or before Aug. 30, 2005.
 Quick Start Guide for Ritetemp Thermostat 8082, 1 page, 2002.
 Remote Control Power Requirement for Ritetemp Thermostat 8082, 1 page, 2002.
 Ritetemp Operation 8029, 3 pages, Jun. 19, 2002.
 Ritetemp Operation 8050, 5 pages, Jun. 26, 2002.
 Ritetemp Operation 8085, pp. 1-6, prior to Apr. 21, 2005.
 Sealed Unit Parts Co., Inc., Supco & CTC Thermostats . . . loaded with features, designed for value!, 6 pages, prior to Apr. 21, 2005.
 Totaline Model P474-1035 Owner's Manual Programmable 5-2 Day Digital Thermostat, pp. 1-21, Apr. 2003.
 Totaline Star CPE230RF, Commercial Programmable Thermostat Wireless Transmitter, Owner's Manual, pp. 1-16, Oct. 1998.
 Totaline Star P/N P474-0130 Non-Programmable Digital Thermostat Owner's Manual, pp. 1-22, prior to Apr. 21, 2005.
 Totaline, "1 For All programmable Digital Thermostat," Owner's Manual P/N P374-1100FM, 23 pages, Nov. 1998.

Totaline, "1 For All Programmable Digital Thermostat," Owner's Manual P/N P474-1050, 21 pages, Nov. 1998.
 Totaline, "1 For All Programmable Digital Thermostat," Owner's Manual P/N P374-1100, 24 pages, Apr. 2001.
 Totaline, "Intellistat Combination Temperature and Humidity Control," Owner's Manual P/N P374-1600, 25 pages, Jun. 2001.
 Totaline, "Programmable Thermostat Configurable for Advanced Heat Pump or Dual Fuel Operation," Owner's Manual P/N P374-1500, 24 pages, Jun. 1999.
 Totaline, "Instructions P/N P474-1010", Manual, 2 pages, Dec. 1998.
 Totaline, "Programmable Thermostat", Homeowner's Guide, 27 pages, Dec. 1998.
 Trouble Shooting Guide for Ritetemp Thermostat 8082, 1 page, 2002.
 Visor Handheld User Guide, 280 pages, Copyright 1999-2000.
 Warmly Yours, "Model TH111GFCI-P (120 VAC)," Manual, pp. 1-4, prior to Jul. 7, 2004.
 White-Rodgers 1F80-224 Programmable Electronic Digital Thermostat, Installation and Operation Instructions, 8 pages, prior to Apr. 21, 2005.
 White-Rodgers Comfort-Set III Thermostat, pp. 1-44, prior to Jul. 7, 2004.
 White-Rodgers Installation Instructions for Heating & Air Conditioning IF78 Non-Programmable Thermostat, 6 pages, prior to Apr. 21, 2005.
 White-Rodgers Installation Instructions for Heating & Air Conditioning IF78 5/2 Day Programmable Thermostat, 7 pages, prior to Jul. 7, 2004.
 White-Rodgers, "Installation Instructions for Heating & Air Conditioning IF72 5/2 Day Programmable Heat Pump Thermostat," 8 pages, prior to Jul. 7, 2004.
 White-Rodgers, "Comfort-Set 90 Series Thermostat," Manual, pp. 1-24, prior to Jul. 7, 2004.
 White-Rodgers, 1F80-240 "(for Heating Only systems) Programmable Electronic Digital Thermostat," Installation and Operation Instructions, 8 pages, prior to Jul. 7, 2004.
 White-Rodgers, 1F80-241 "Programmable Electronic Digital Thermostat," Installation and Operation Instructions, 6 pages, prior to Jul. 7, 2004.
 White-Rodgers, 1F80-261 "Programmable Electronic Digital Thermostat," Installation and Operation Instructions, 8 pages, prior to Jul. 7, 2004.
 White-Rodgers, 1F81-261 "Programmable Electronic Digital Multi-Stage Thermostat," Installation and Operation Instructions, 8 pages, prior to Jul. 7, 2004.
 White-Rodgers, 1F82-261 "Programmable Electronic Digital Heat Pump Thermostat," Installation and Operation Instructions, 8 pages, prior to Jul. 7, 2004.
 White-Rodgers, Comfort-Set 90 Series Premium, 4 pages, prior to Apr. 21, 2005.
www.icmcontrols.com, Simplecomfort, SC3000 Single Stage Heat/Single Stage Cool or Single Stage Heat Pump/Manual Changeover, 1 page, prior to Jul. 7, 2004.
www.icmcontrols.com, Simplecomfort, SC3001 Single Stage Heat/Single Stage Cool or Single Stage Heat Pump/Manual Changeover, 1 page, prior to Jul. 7, 2004.
www.icmcontrols.com, Simplecomfort, SC3006 Single Stage Heat/Single Stage Cool or Single Stage Heat Pump/Manual Changeover, 1 page, prior to Jul. 7, 2004.
www.icmcontrols.com, Simplecomfort, SC3201 2 Stage Heat Pump Manual Changeover, 1 page, prior to Jul. 7, 2004.
www.icmcontrols.com, Simplecomfort, SC3801 2 Stage Heat/2 Stage Cool 2 Stage Heat Pump/Audio Changeover, 1 page, prior to Jul. 7, 2004.
 AED Electronics, Inc., "Presenting Climatouch the Most Innovative Thermostat in the World!," 2 pages, prior to Nov. 30, 2007.
 Climatouch, User Manual, Climatouch CT03TSB Thermostat, Climatouch CT03TSHB Thermostat with Humidity Control, Outdoor UHF Temperature Transmitter 217S31, 19 pages, printed Sep. 15, 2004.
 Carrier, "Edge Performance Programmable Owner's Manual," 64 pages, 2007.
 Lux, "9000RF Remote Instructions," 2 pages, prior to Nov. 30, 2007.

(56)

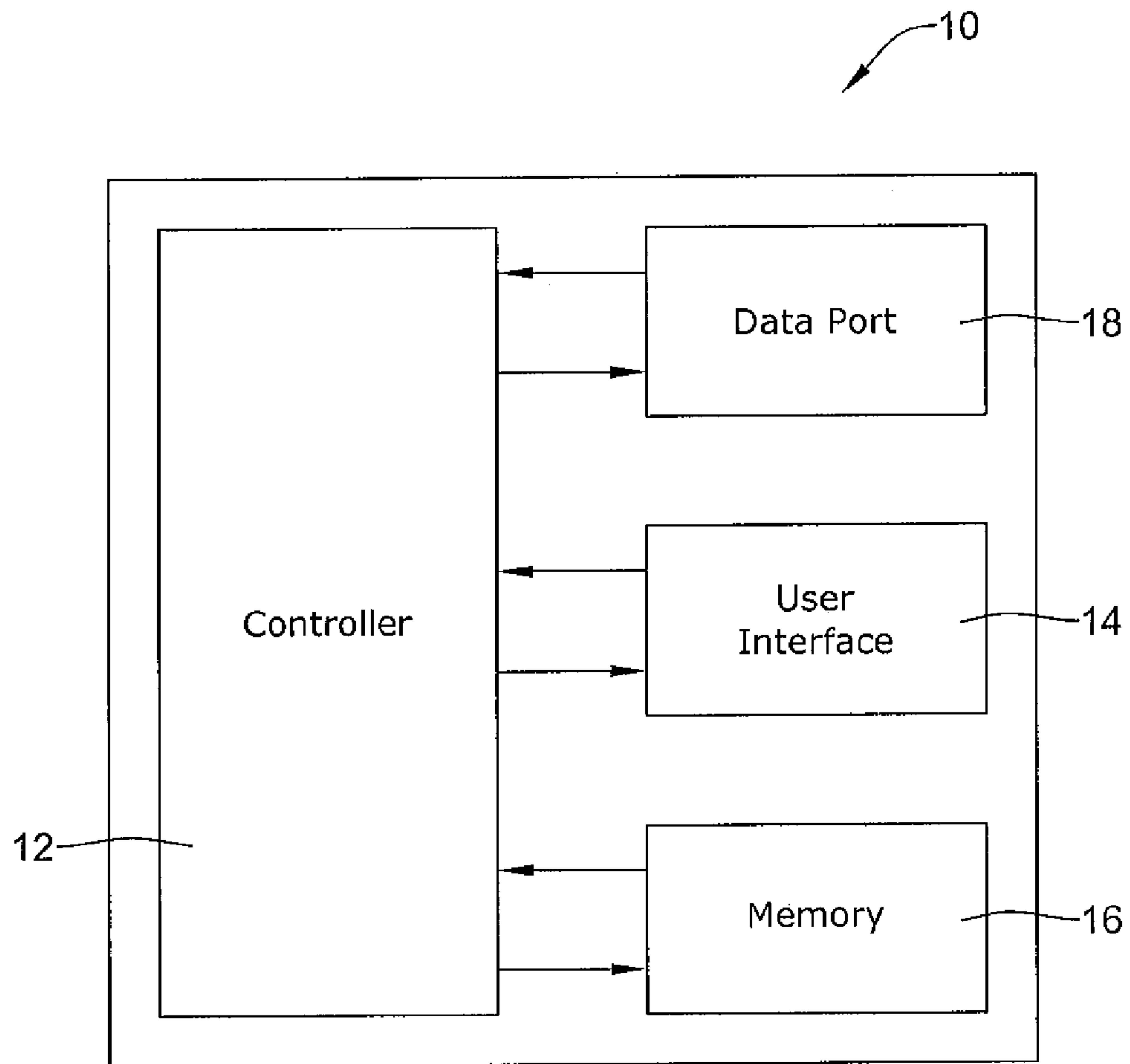
References Cited

OTHER PUBLICATIONS

Totaline, “P/N P374-0431 Thermostat Remote Control and Receiver,” Owner’s Manual, 11 pages, prior to Nov. 30, 2007.
Totaline, “Wireless Remote Sensor, Model P474-0401-1RF/REC,” 2 pages, prior to Nov. 30, 2007.
Totaline, “P474-1100RF, P474-1100REC Wireless Thermostat,” 1 page, prior to Nov. 30, 2007.

Totaline, “Wireless Programmable Digital Thermostat,” Owner’s Manual P474-1100RF, 21 pages, 2000.
Lennox, “Network Control Panel (NCP),” User’s Manual, 18 pages, Nov. 1999.
Honeywell, “Excel Building Supervisor-Integrated R7044 and FS90 Ver. 2.0,” Operator Manual, 70 pages, Apr. 1995.
Trane, “System Programming, Tracer Summit Version 14, BMTW-SVP01D-EN,” 623 pages, 2002.

* cited by examiner

*Figure 1*

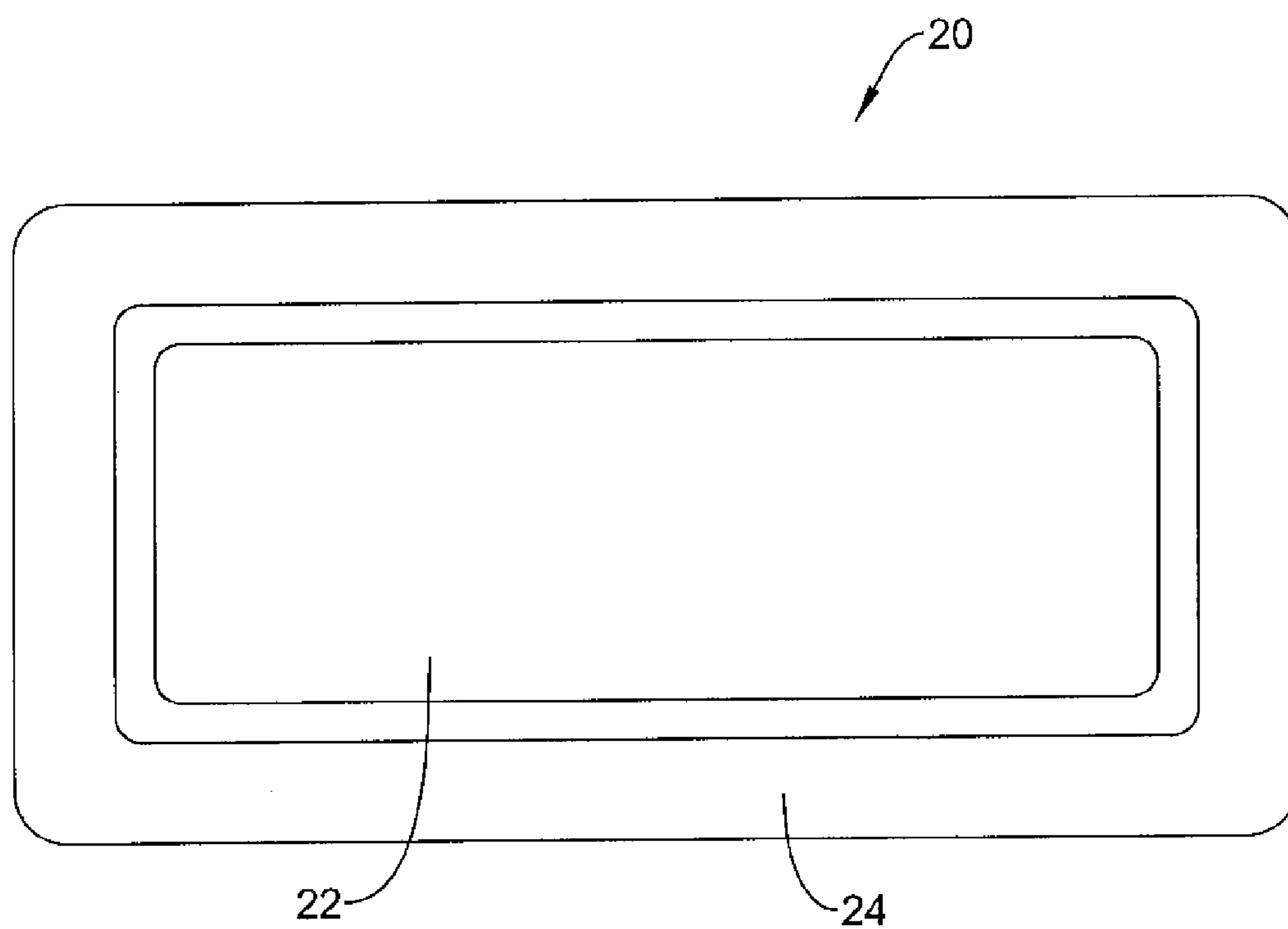
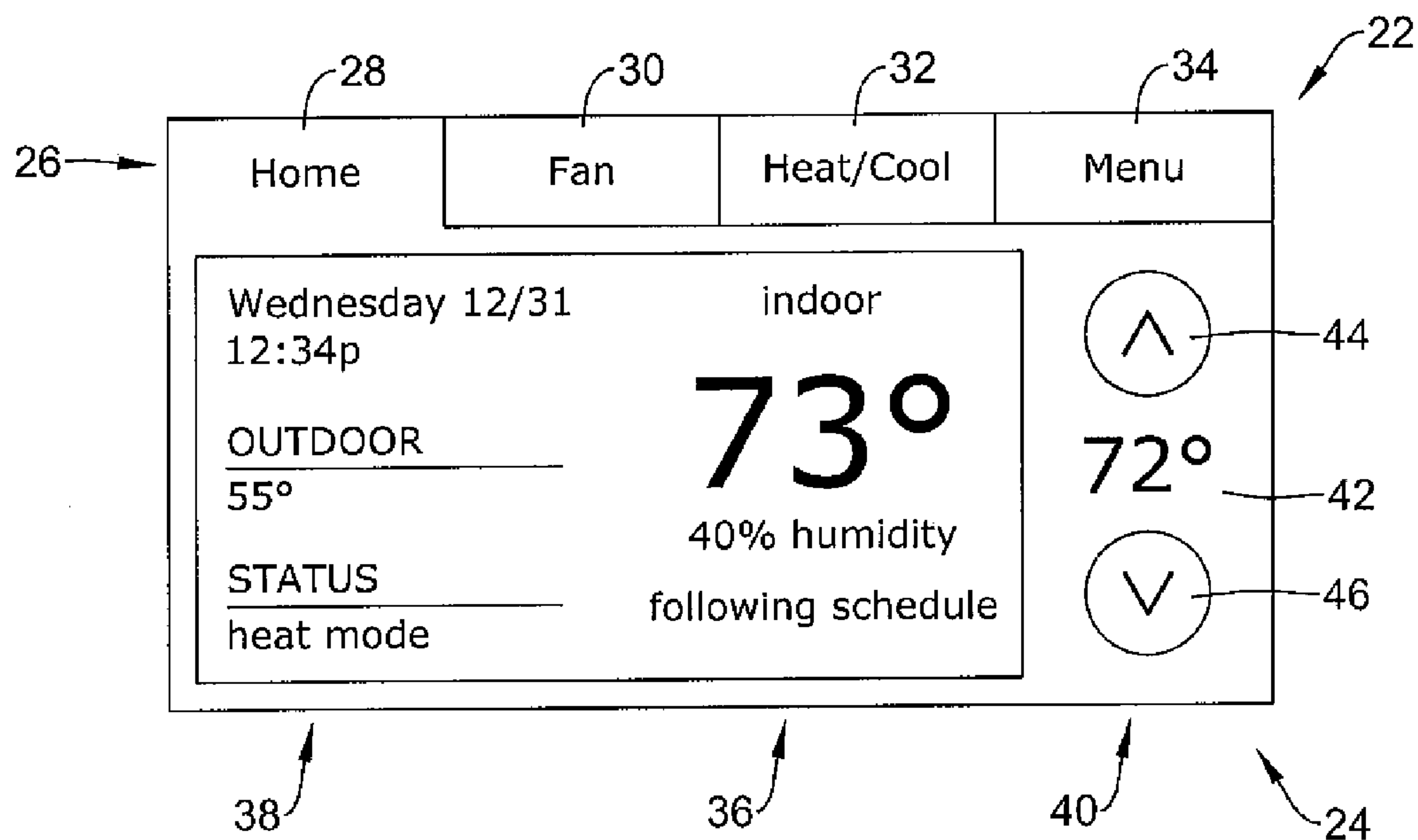
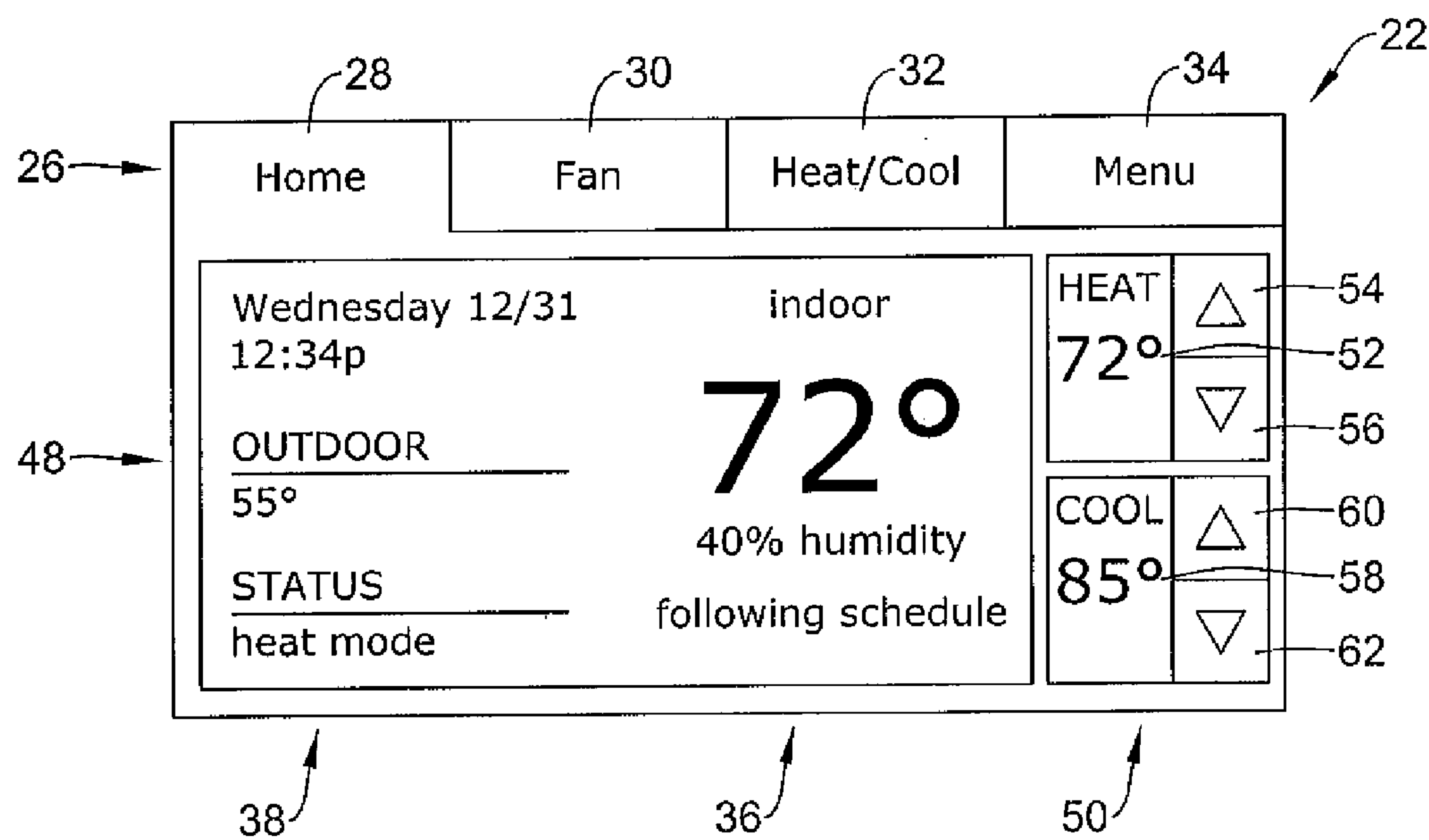
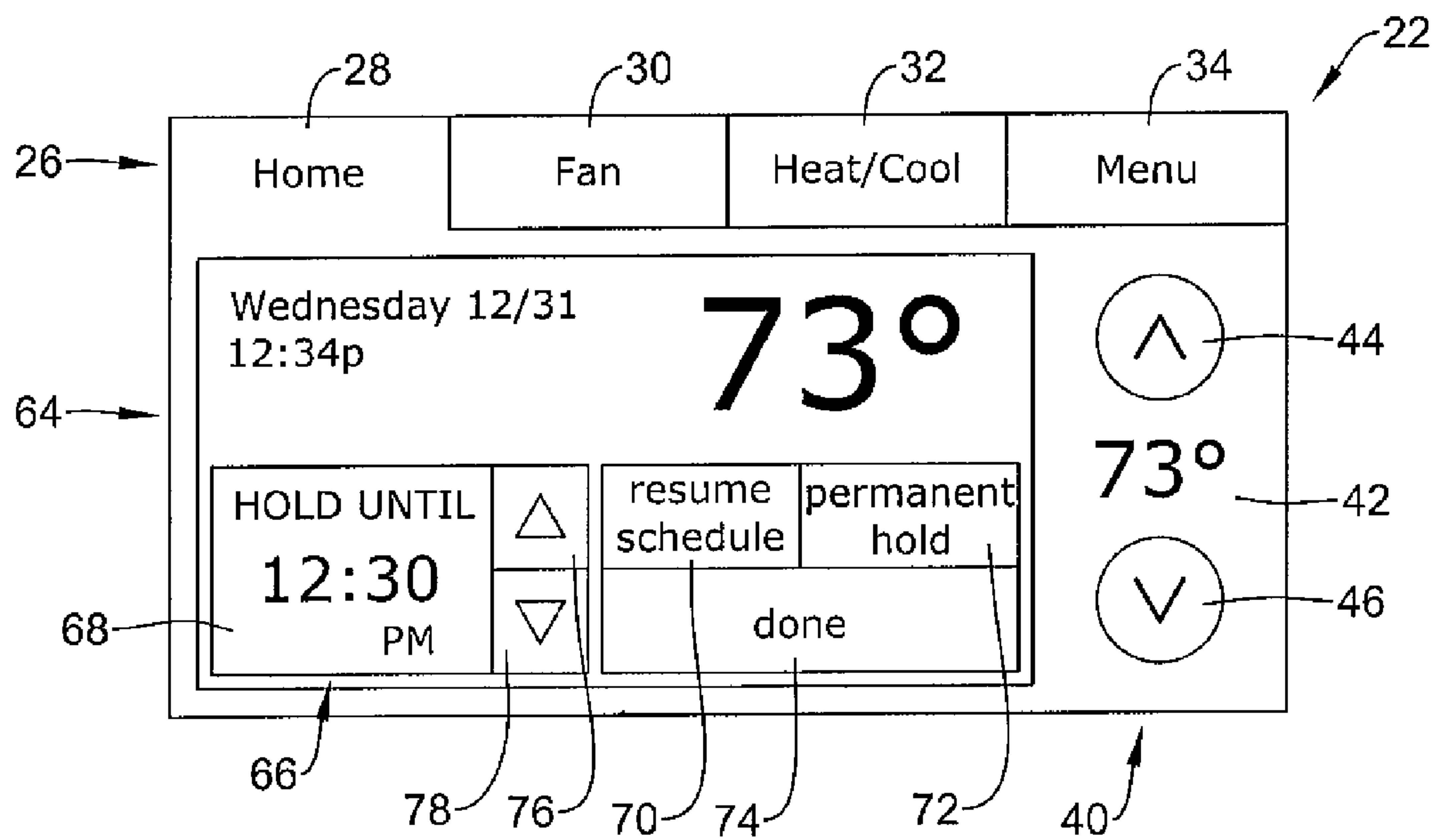
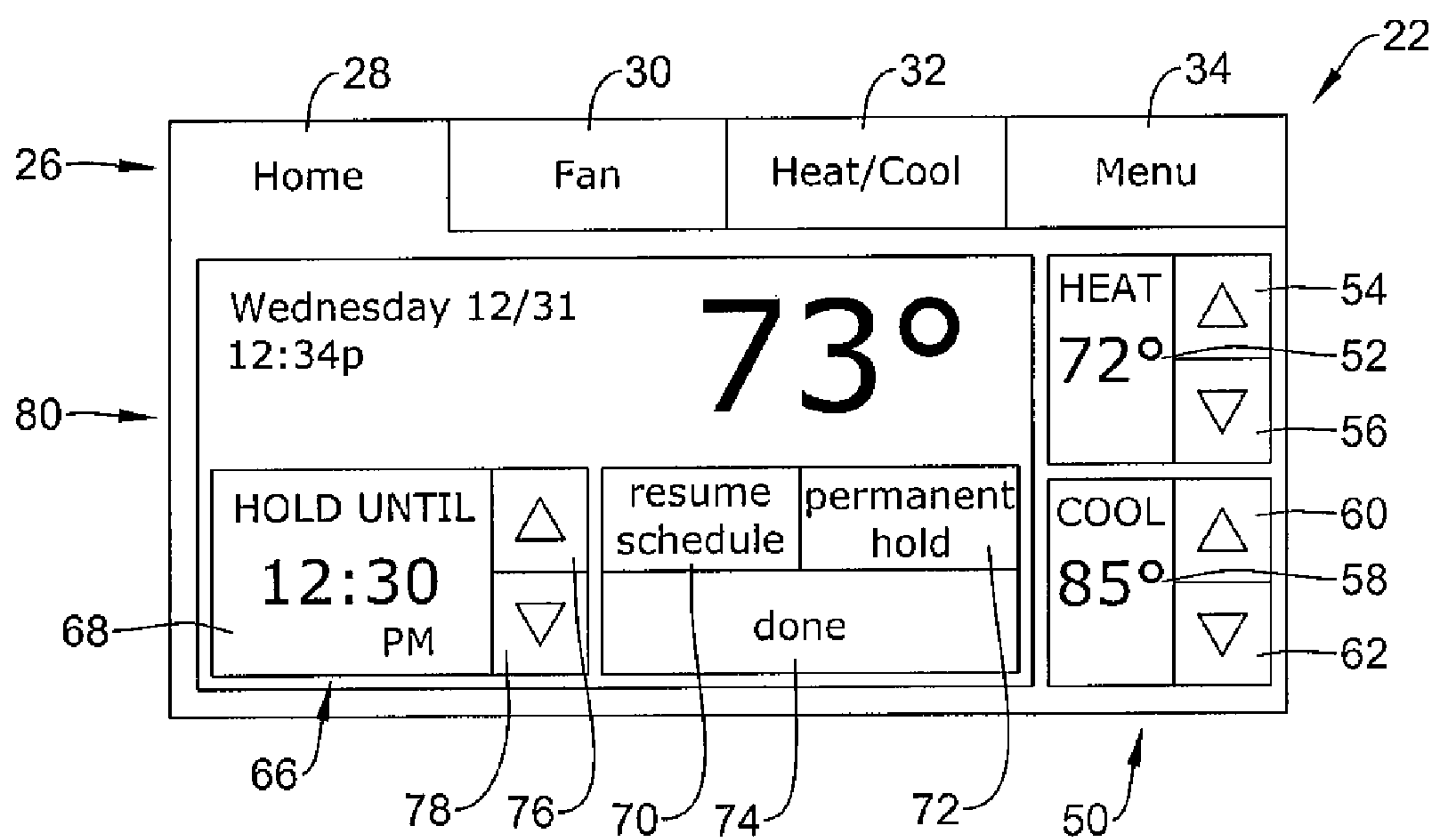
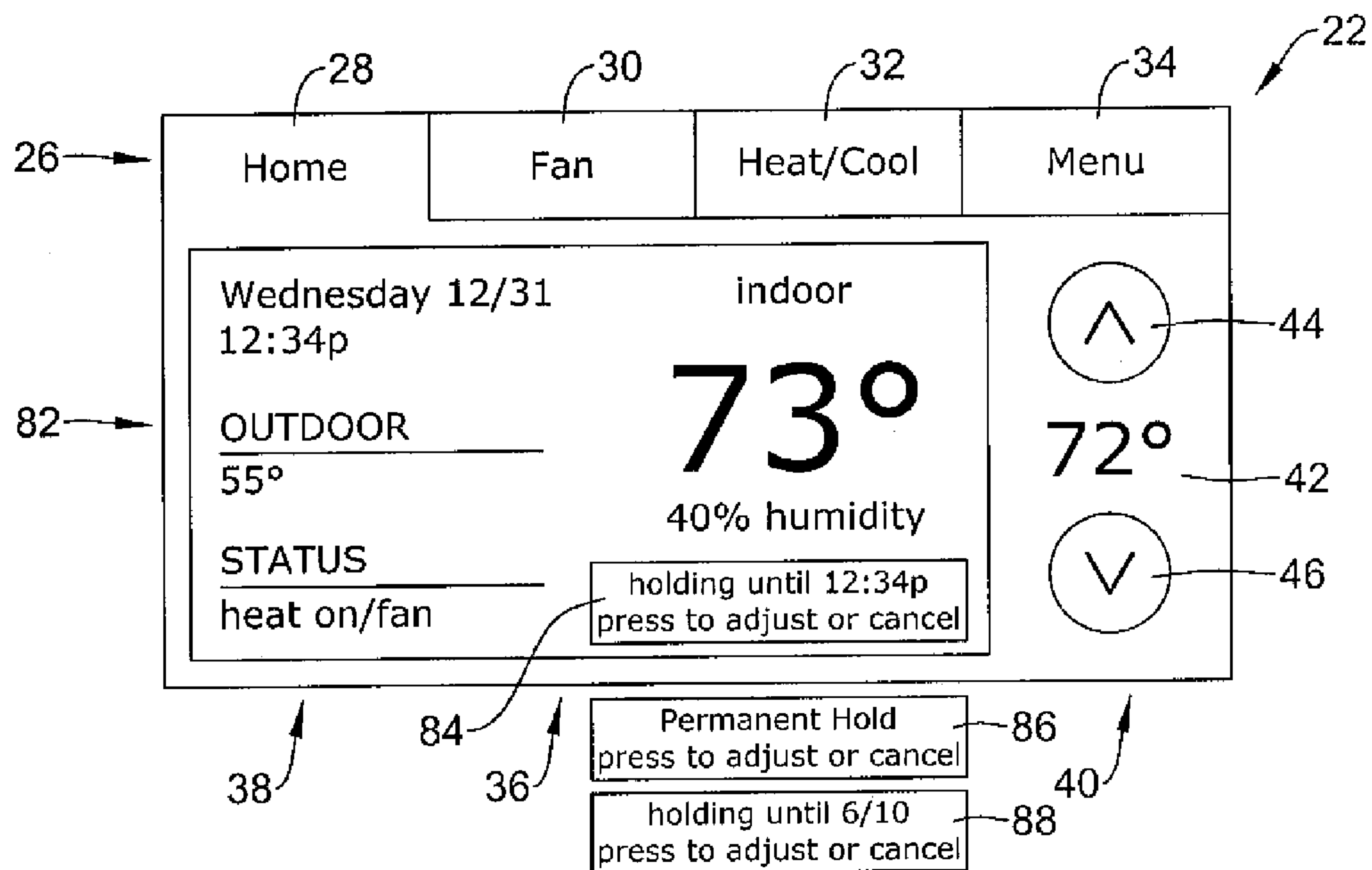
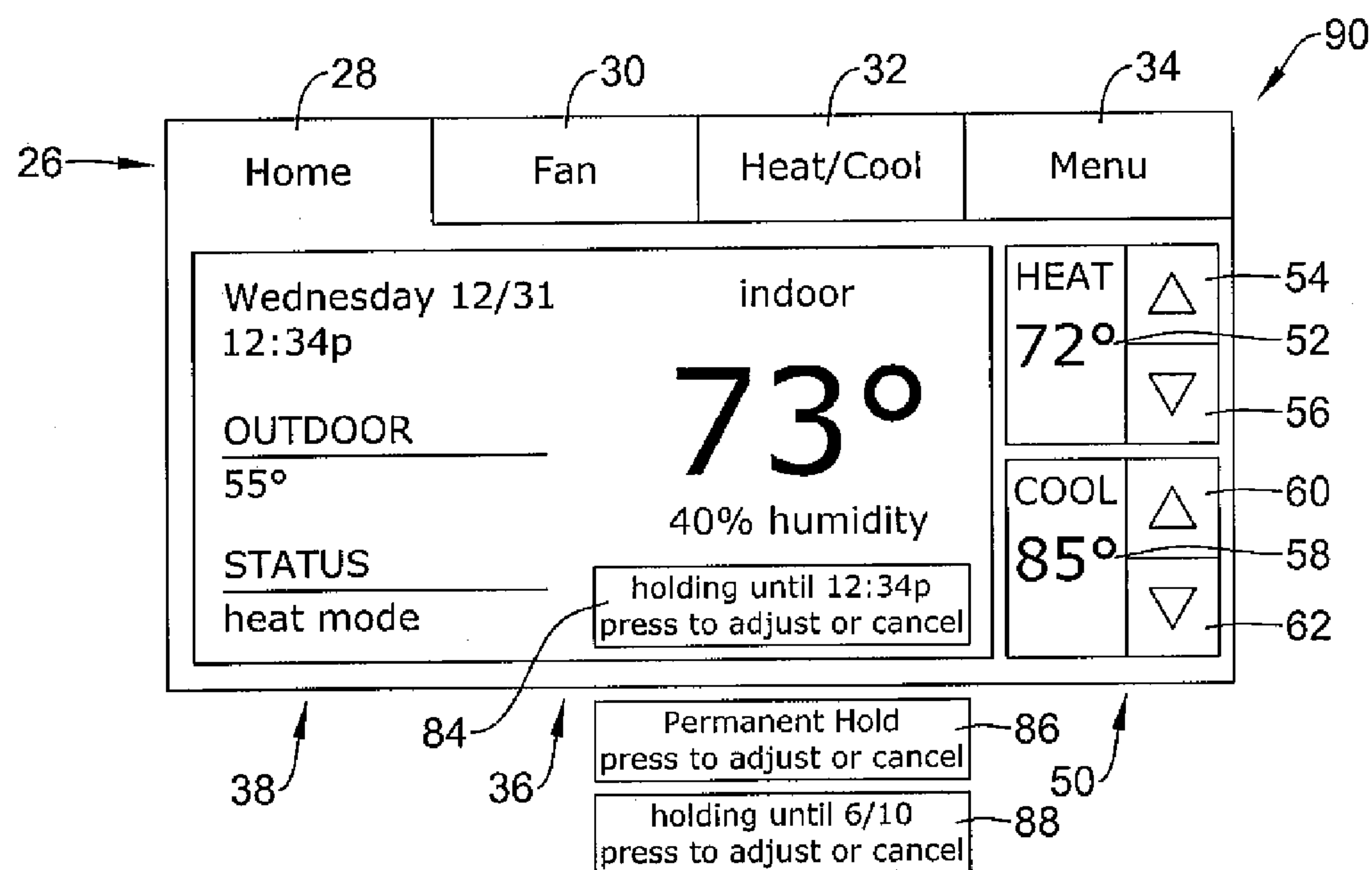
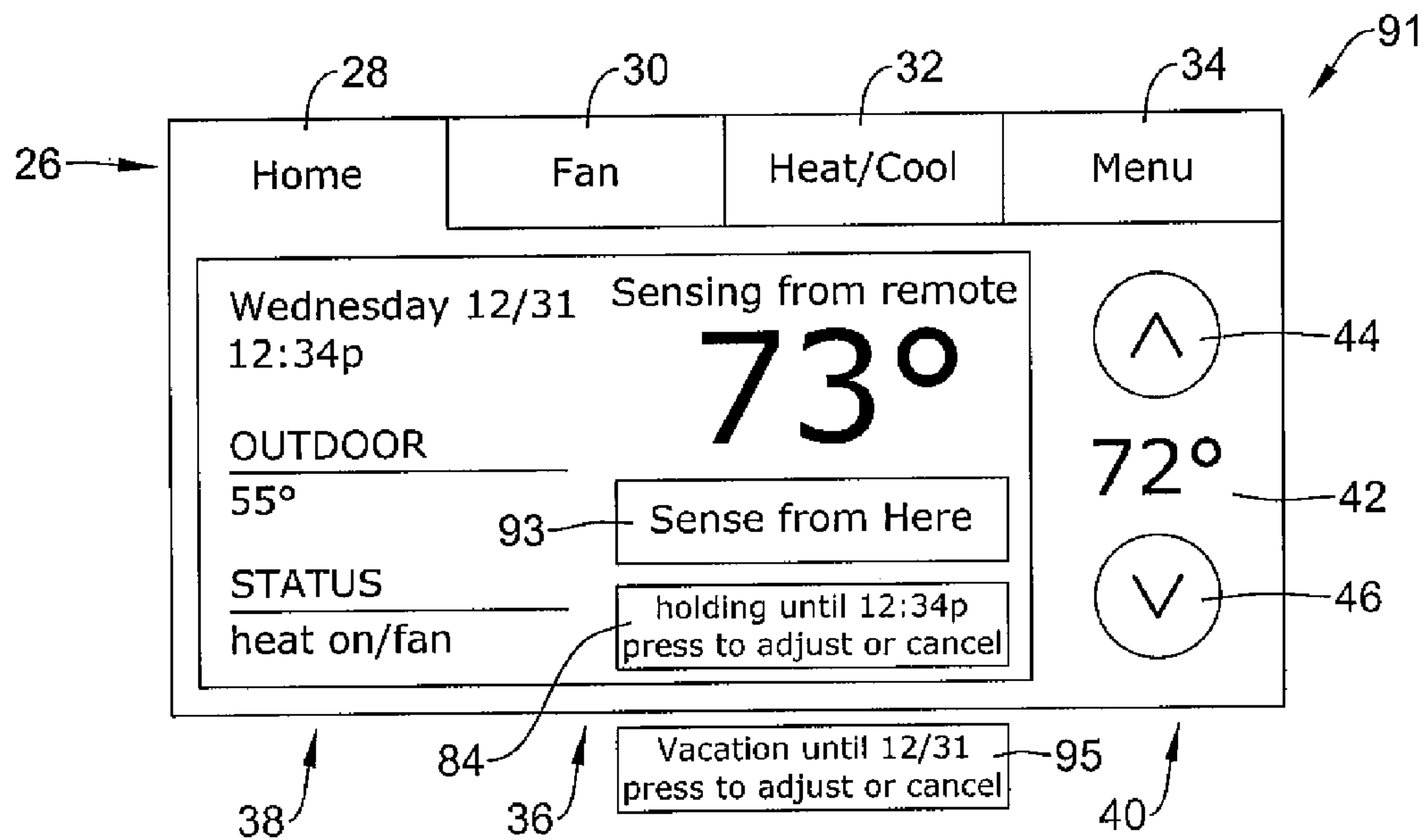
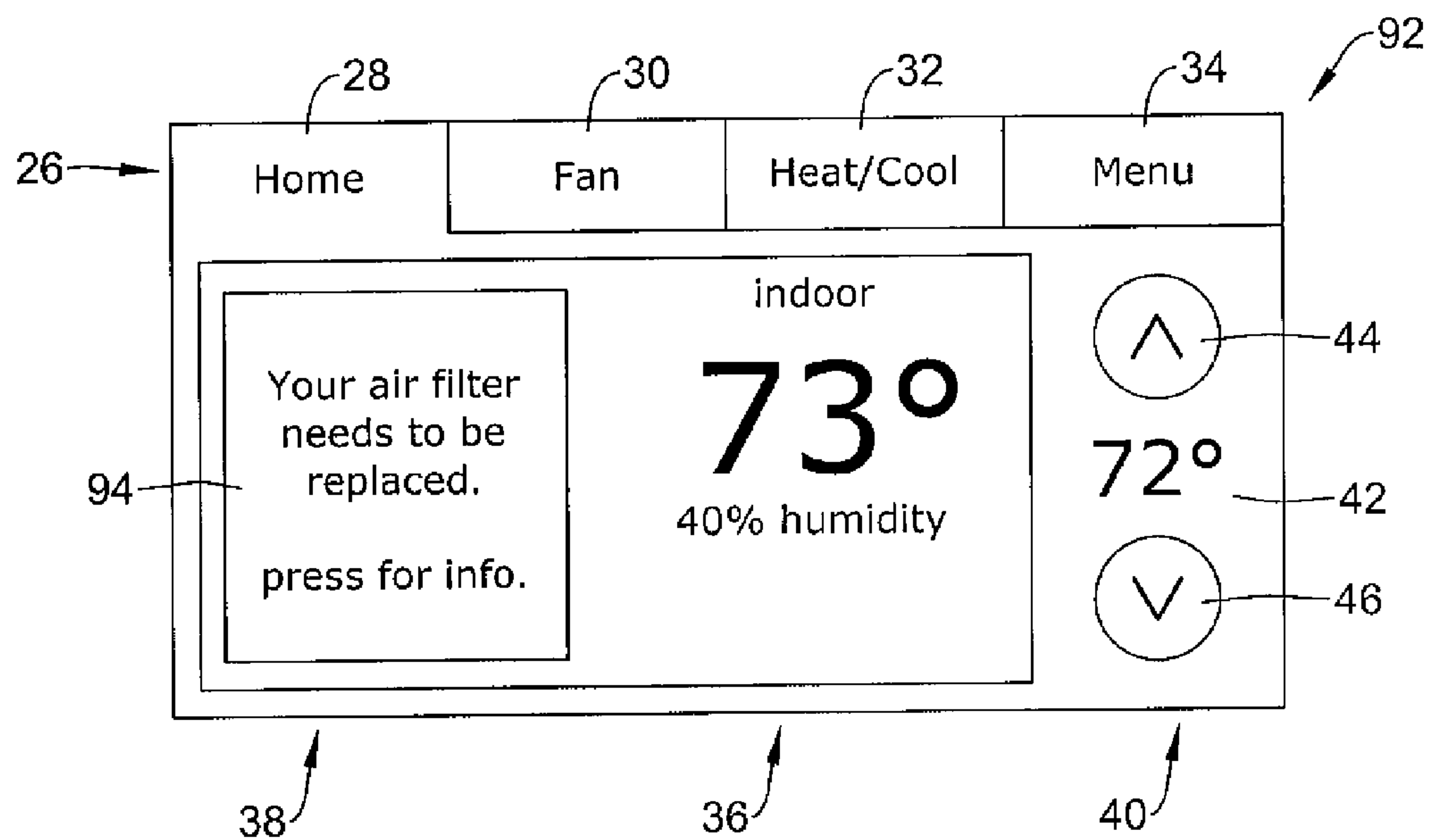


Figure 2

*Figure 3**Figure 4*

*Figure 5**Figure 6*

*Figure 7**Figure 8*

*Figure 9**Figure 10*

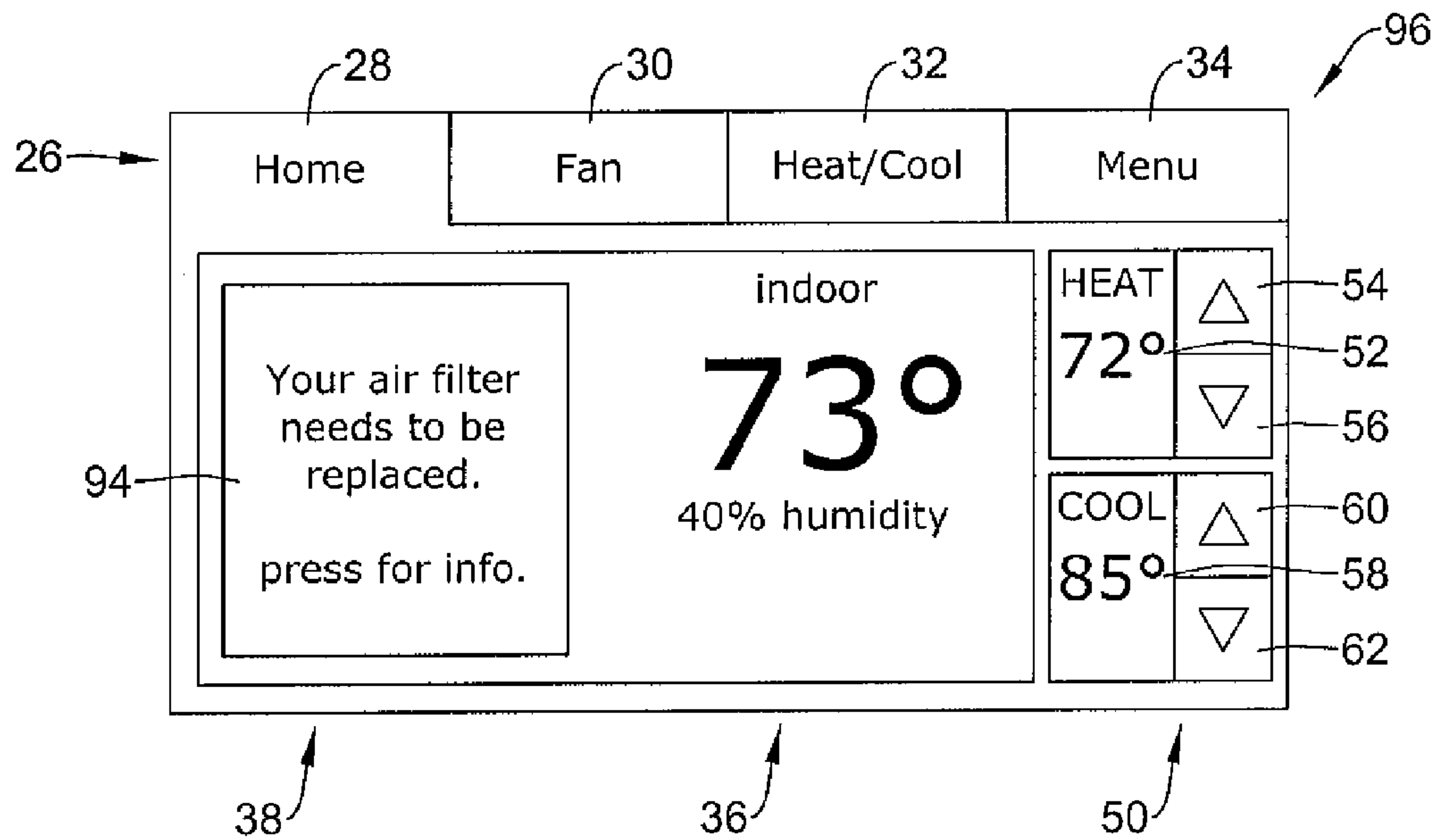


Figure 11

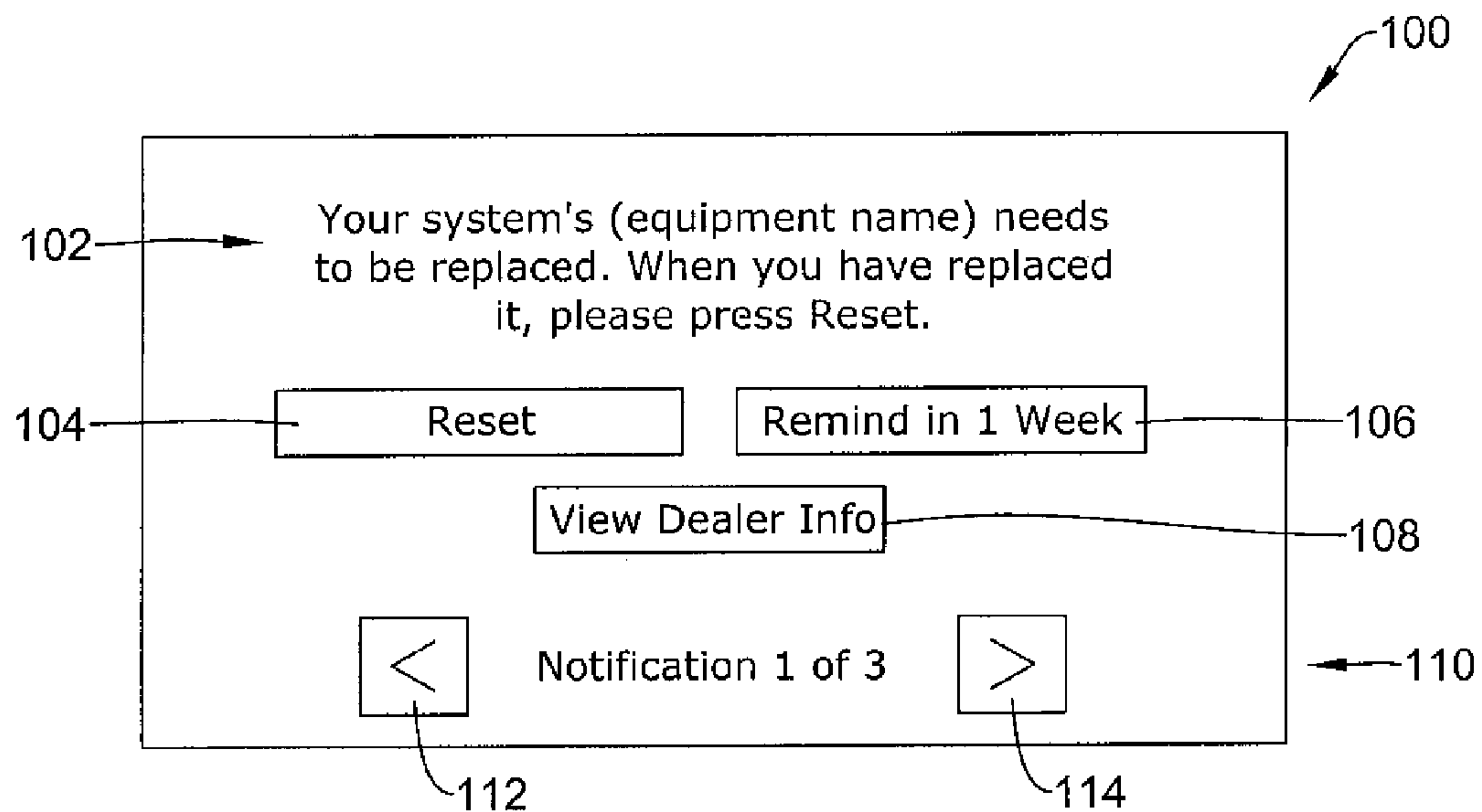
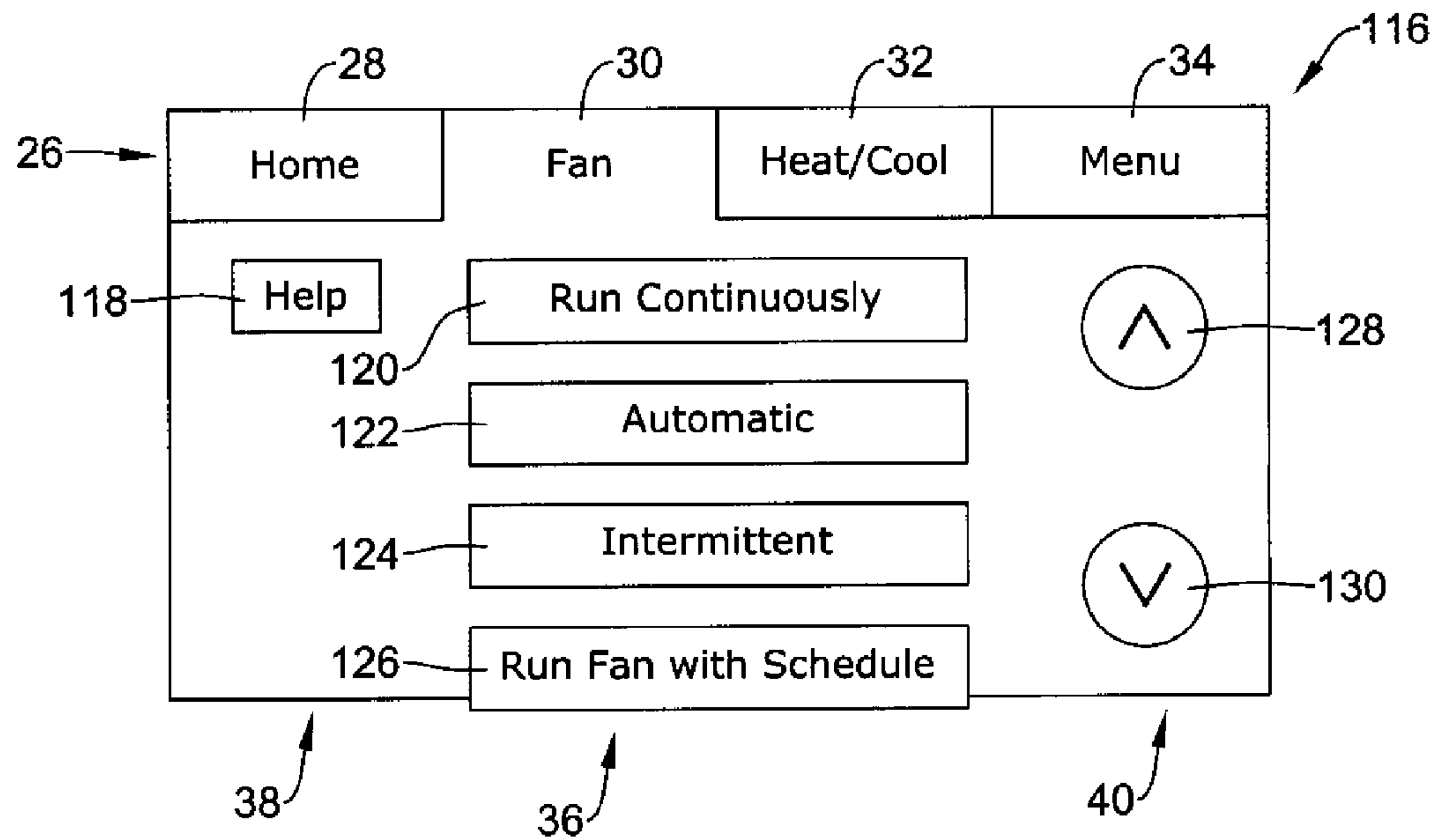
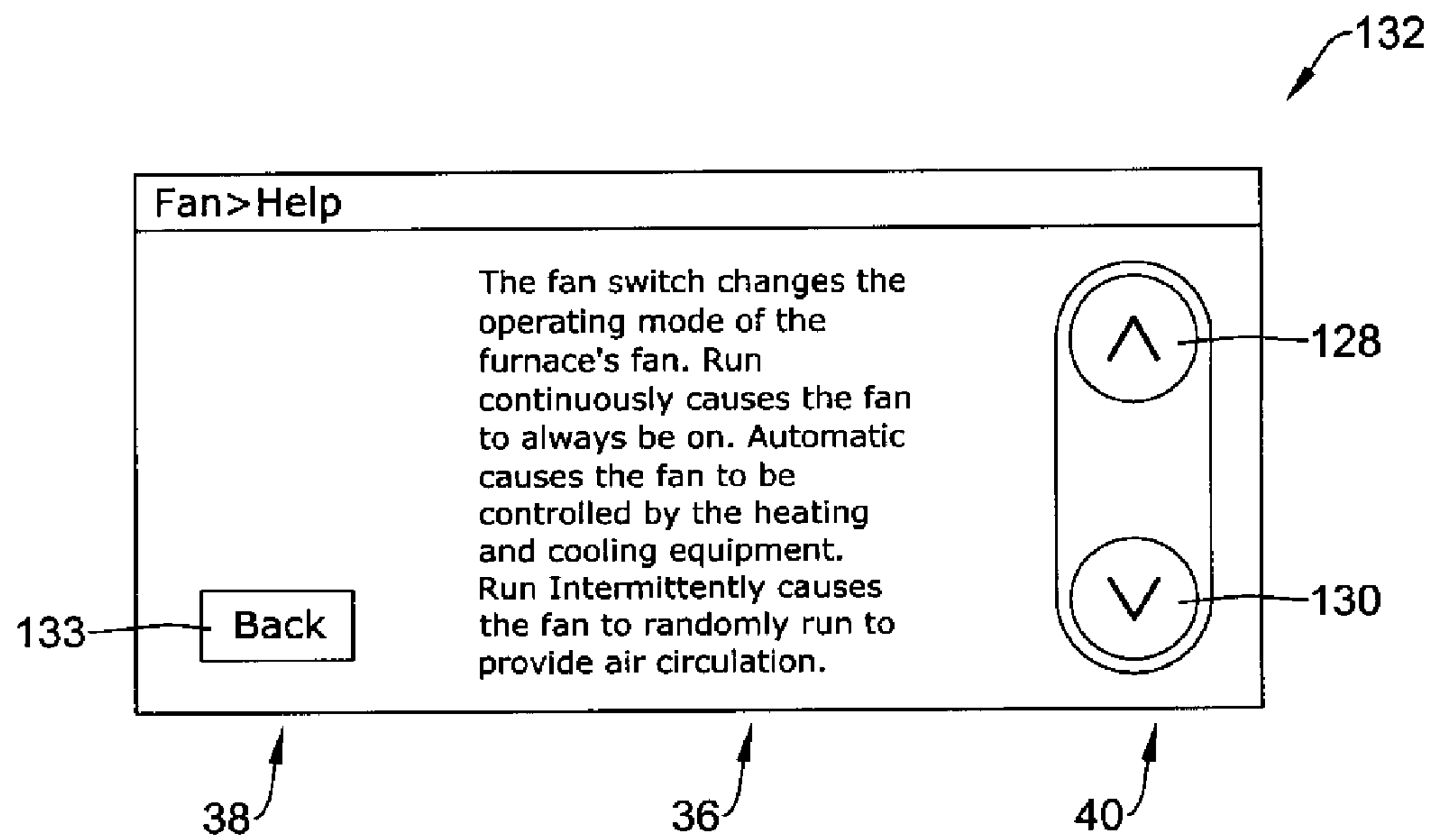
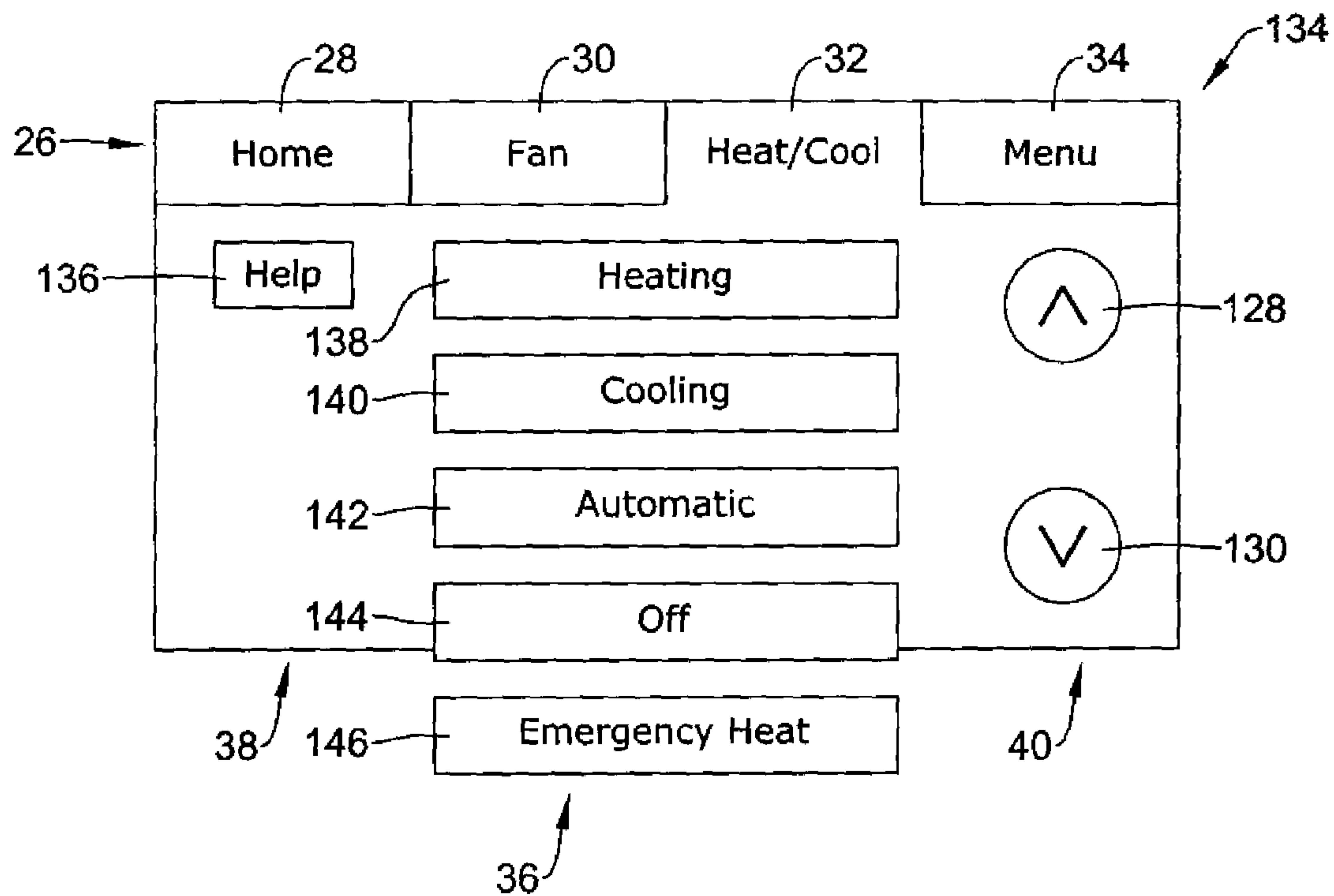
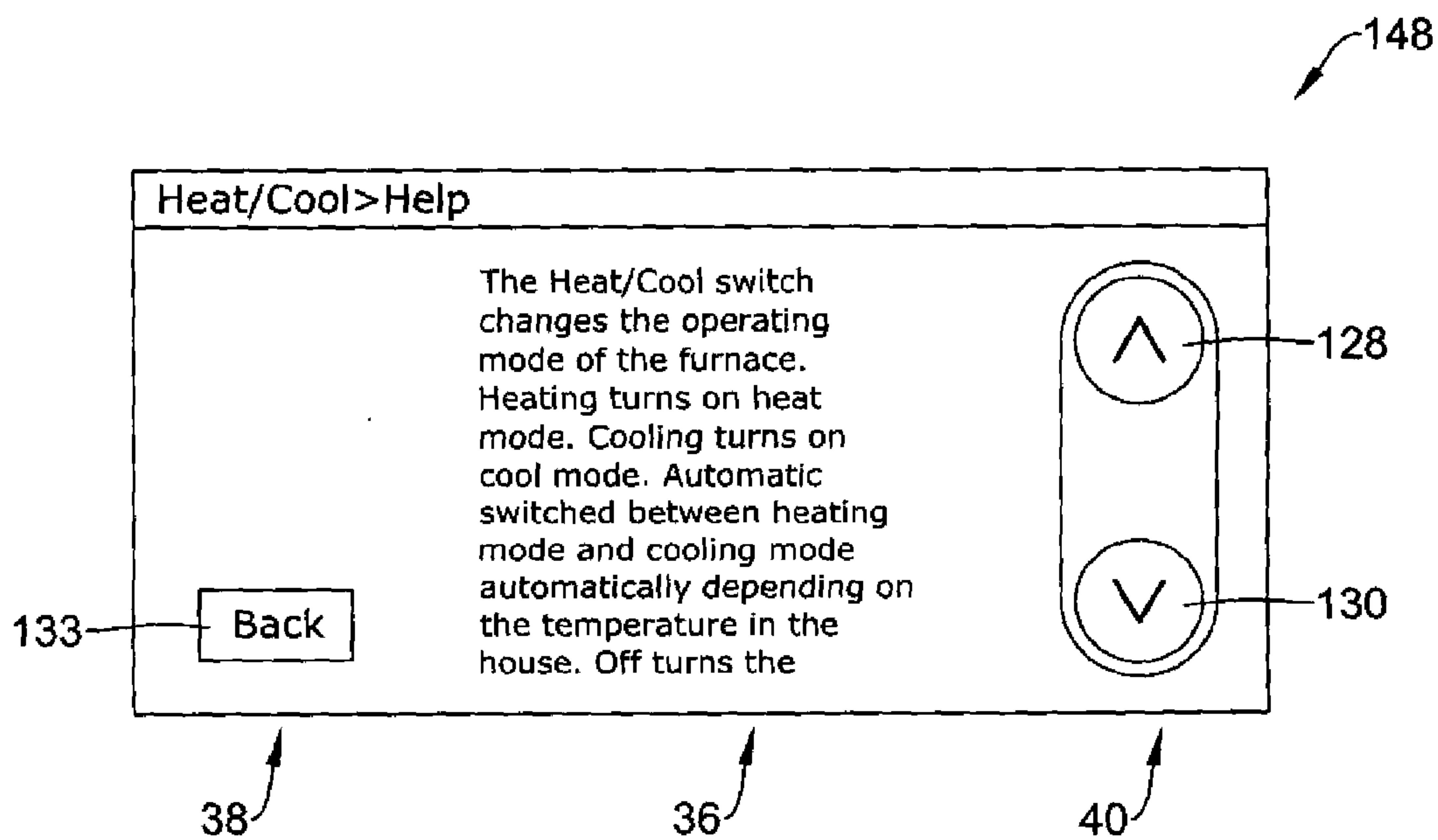
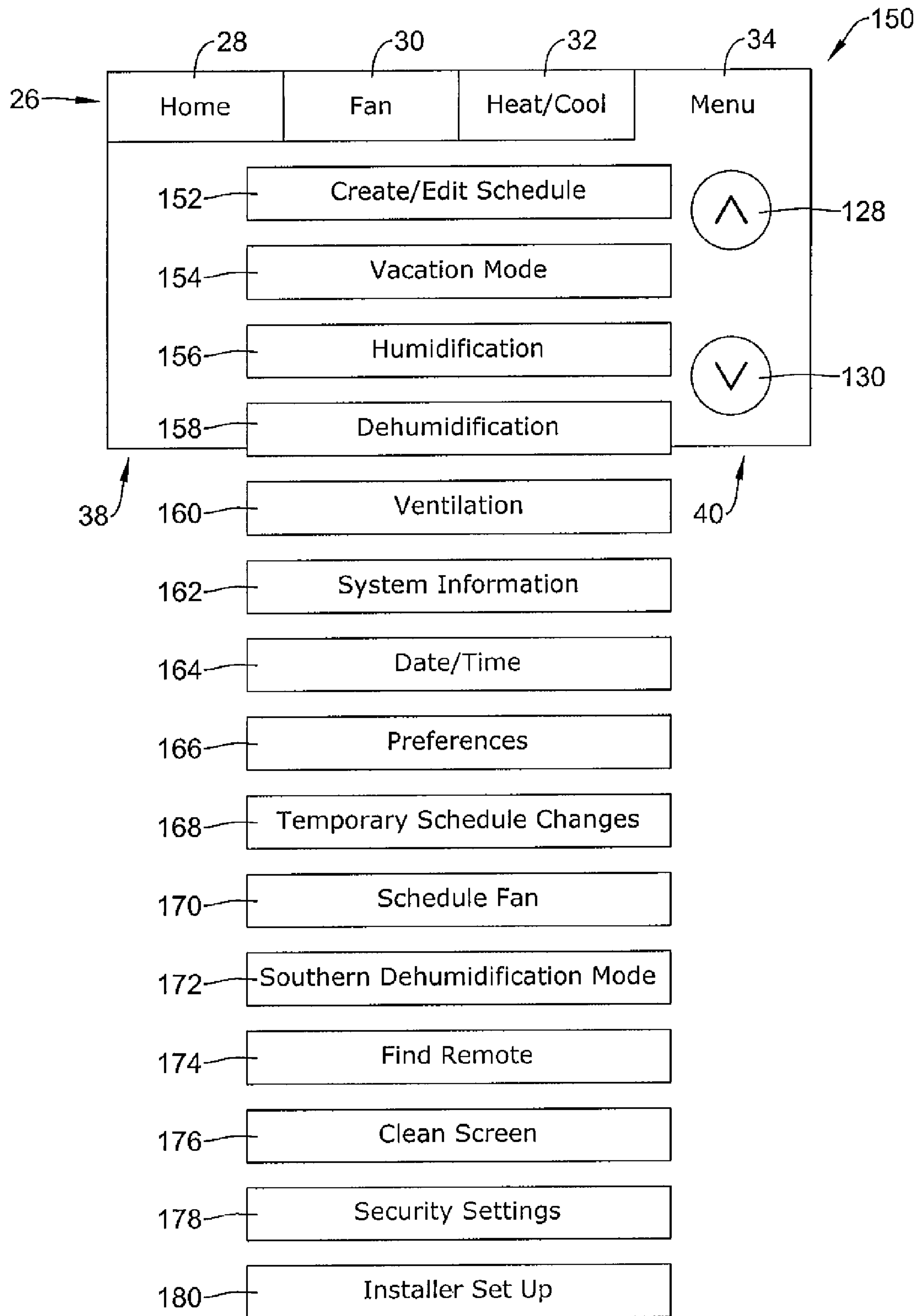


Figure 12

*Figure 13**Figure 14*

*Figure 15**Figure 16*

*Figure 17*

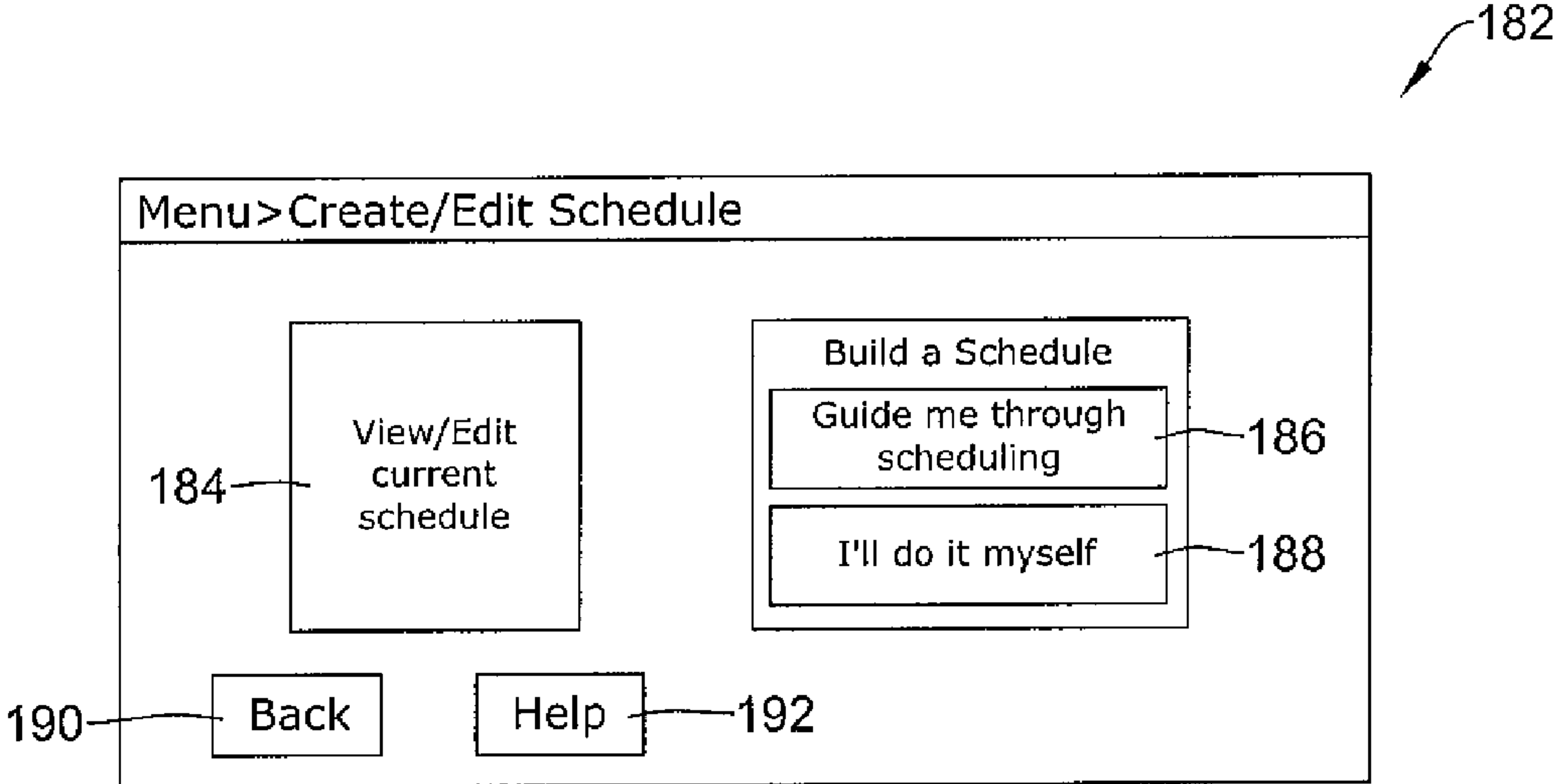


Figure 18

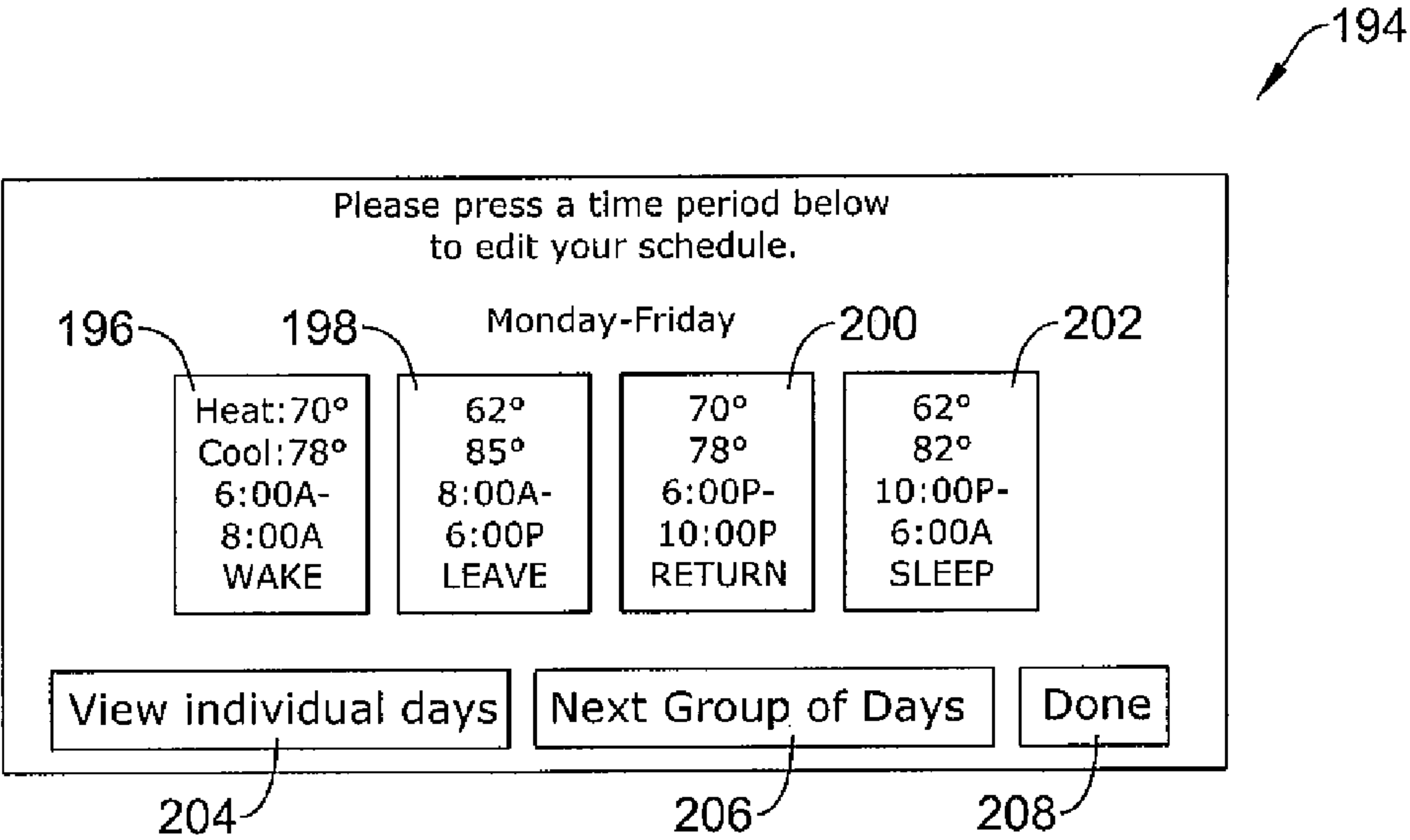


Figure 19

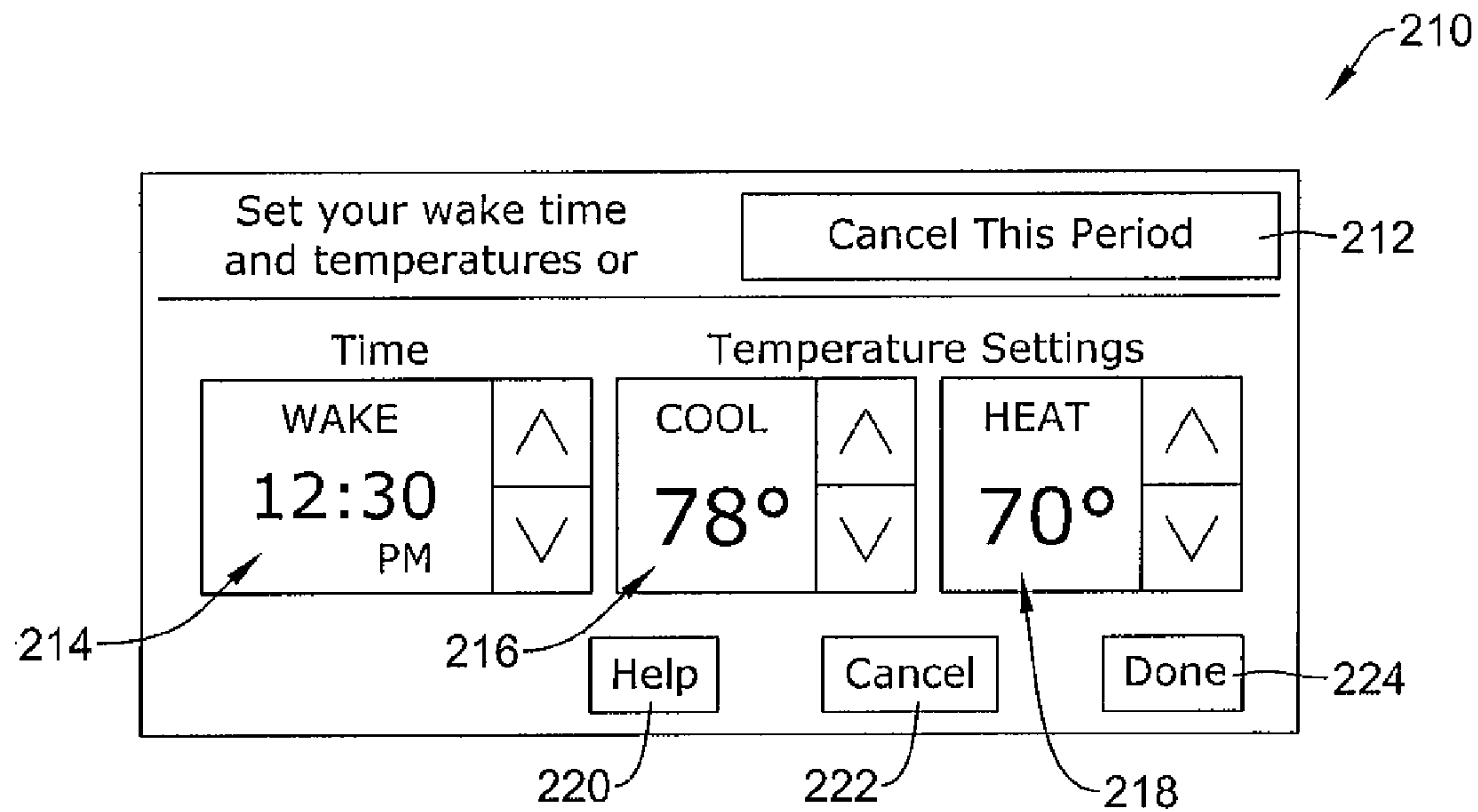


Figure 20

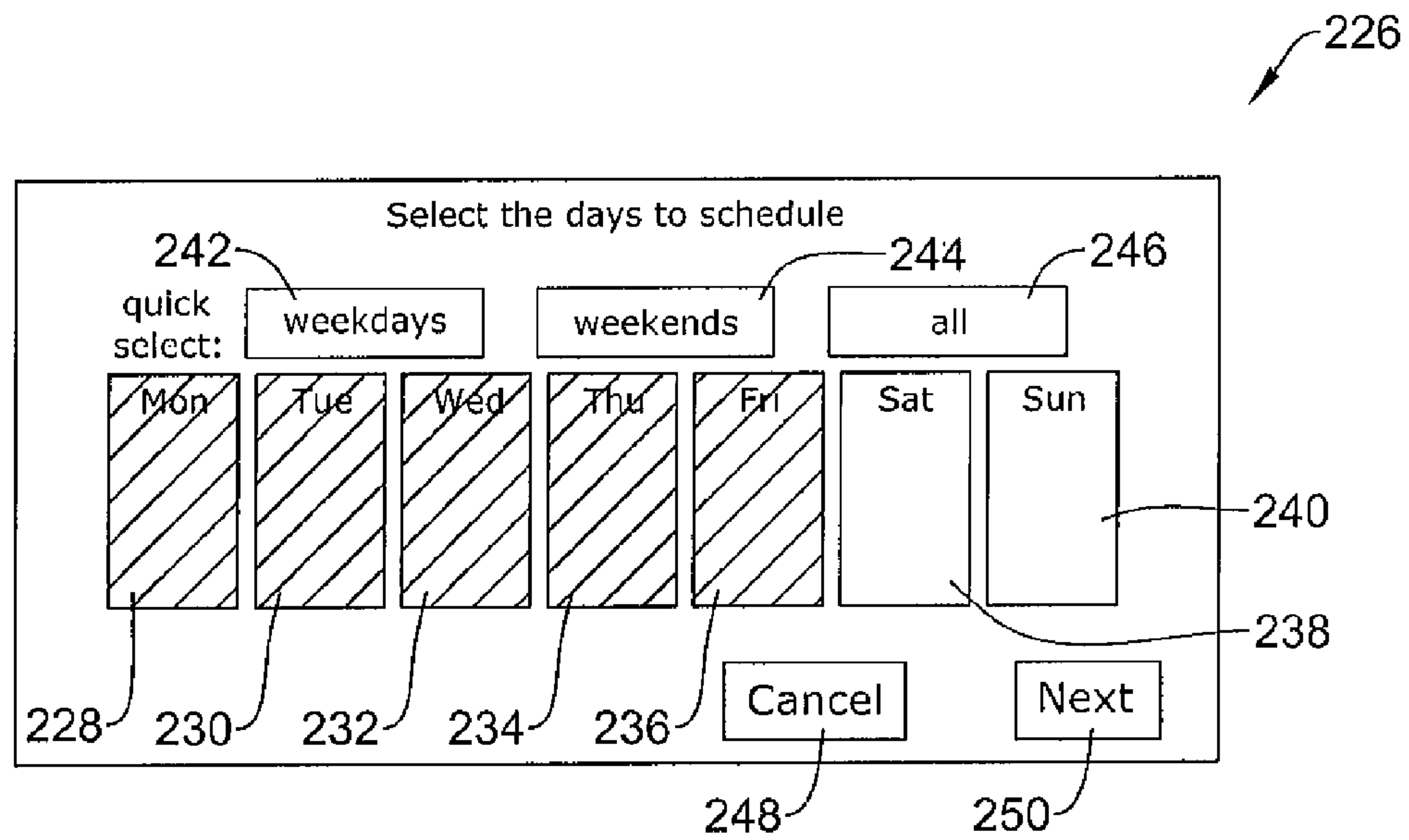


Figure 21

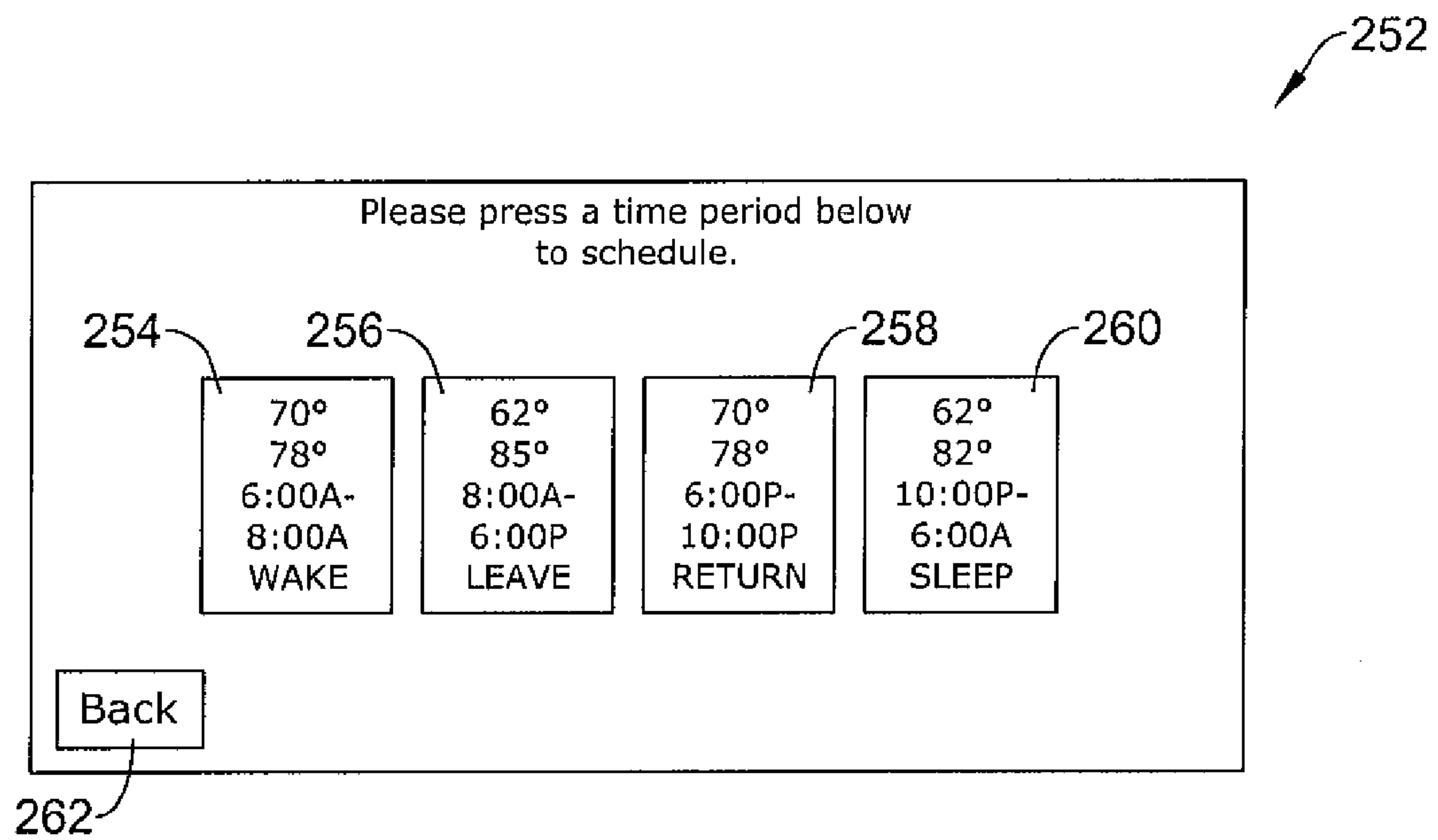


Figure 22

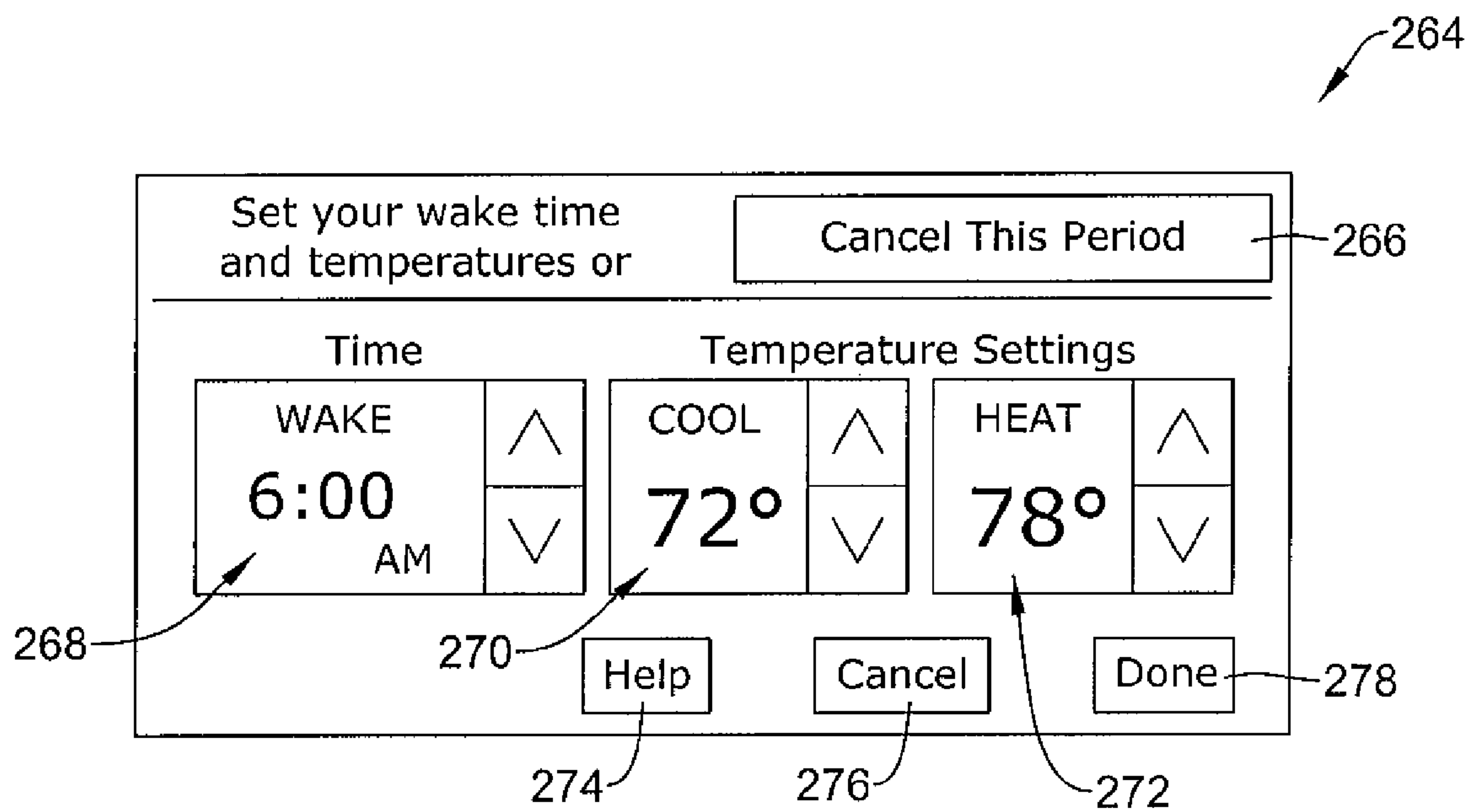
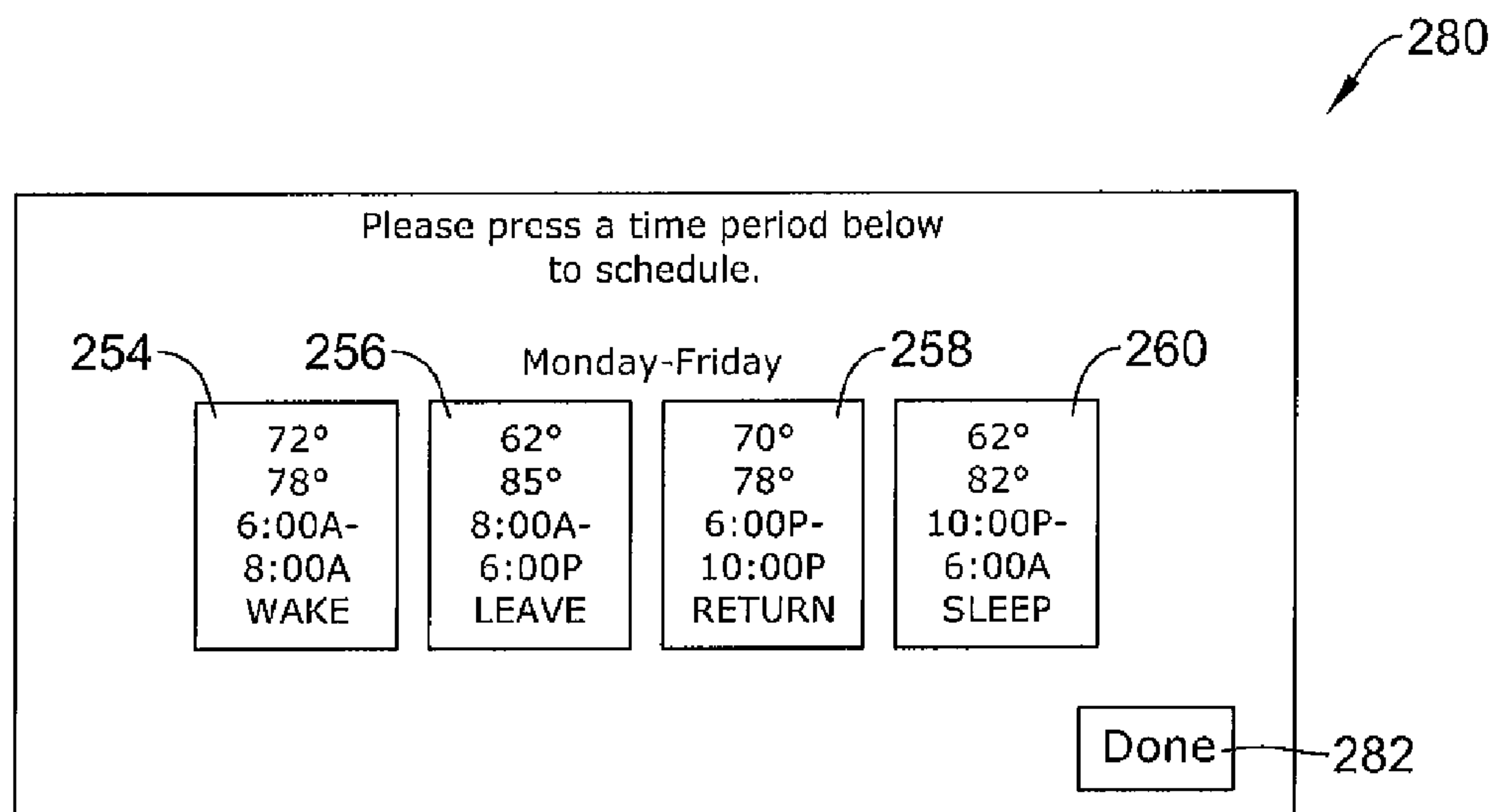
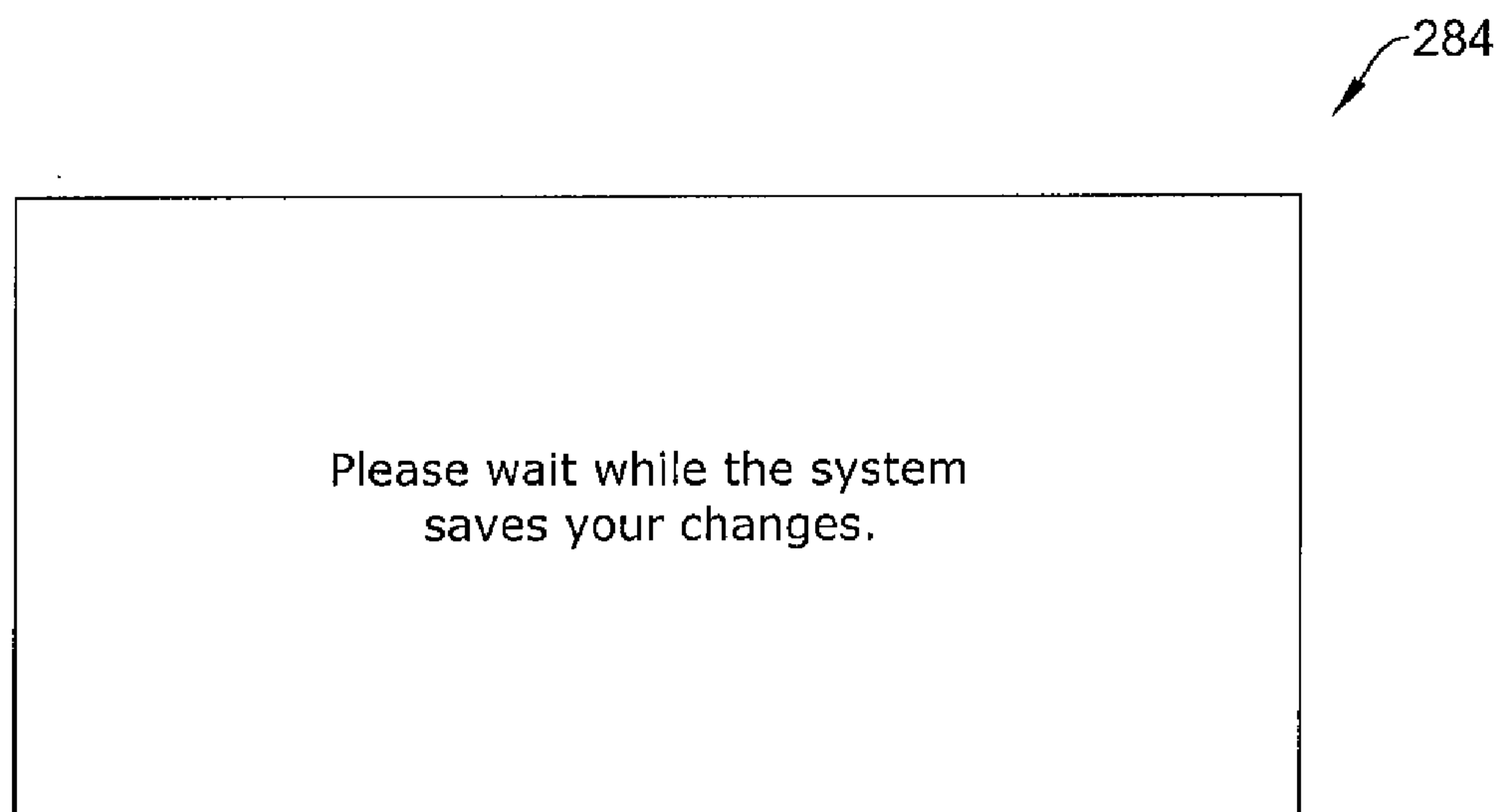
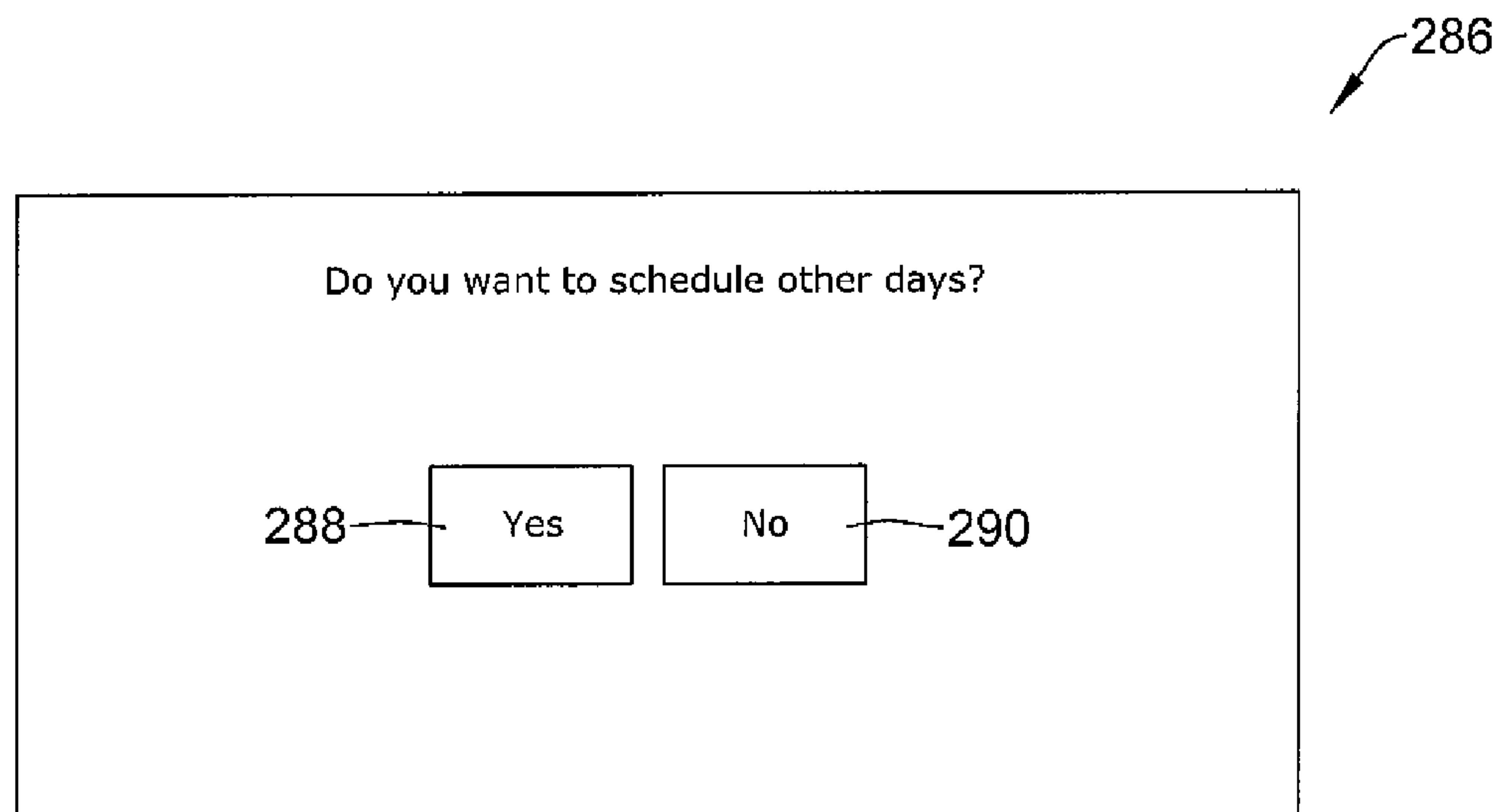
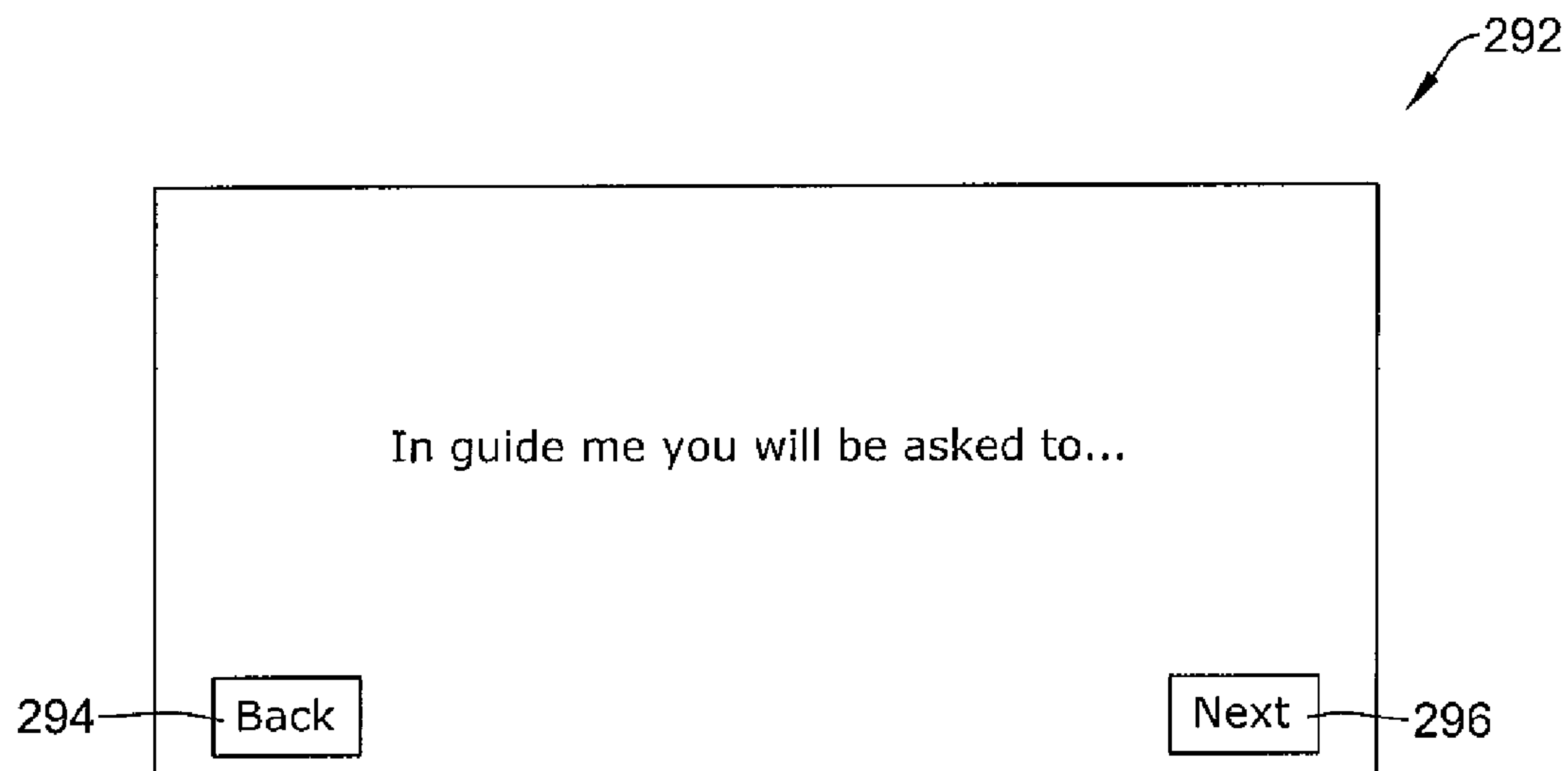


Figure 23

*Figure 24**Figure 25*

*Figure 26**Figure 27*

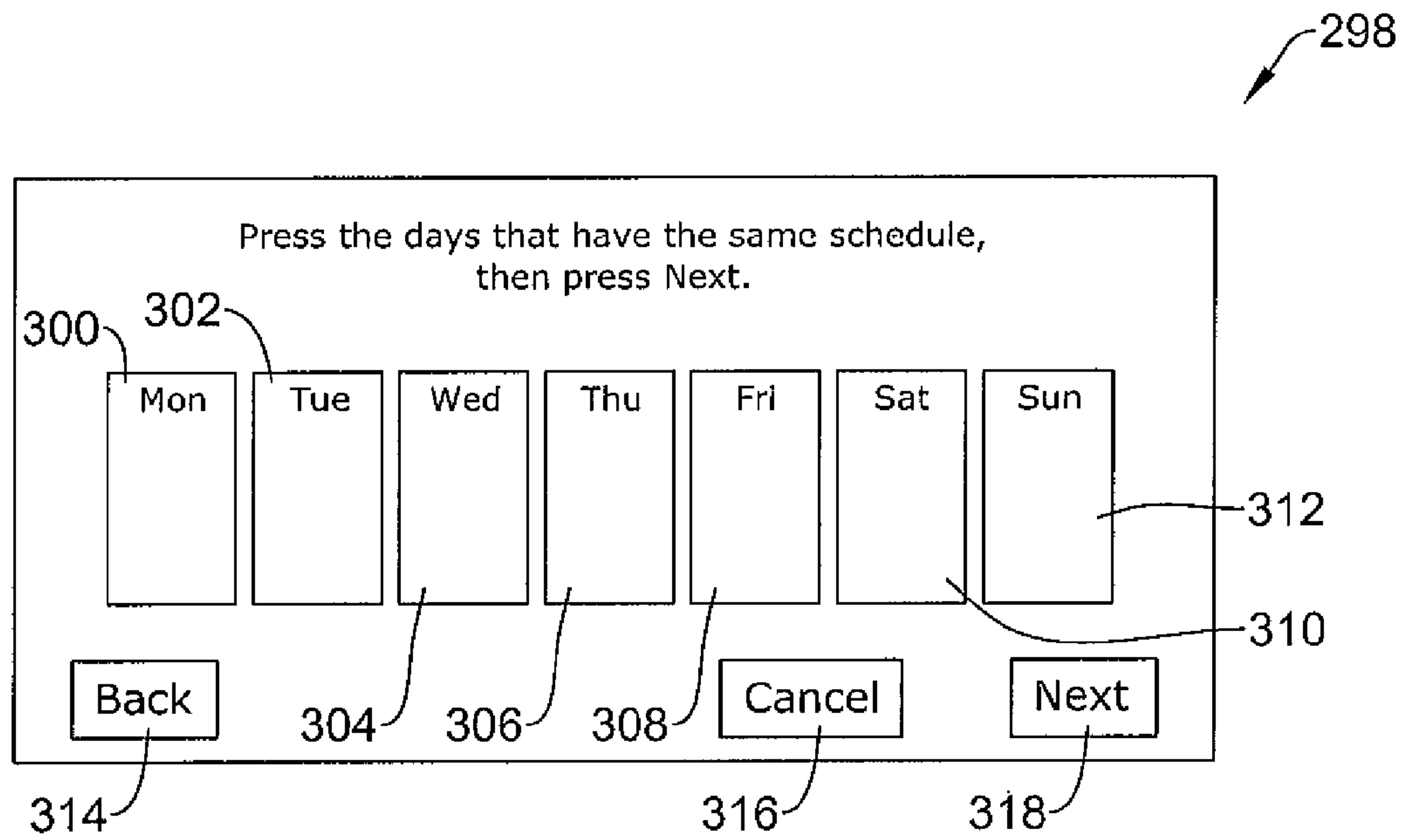


Figure 28

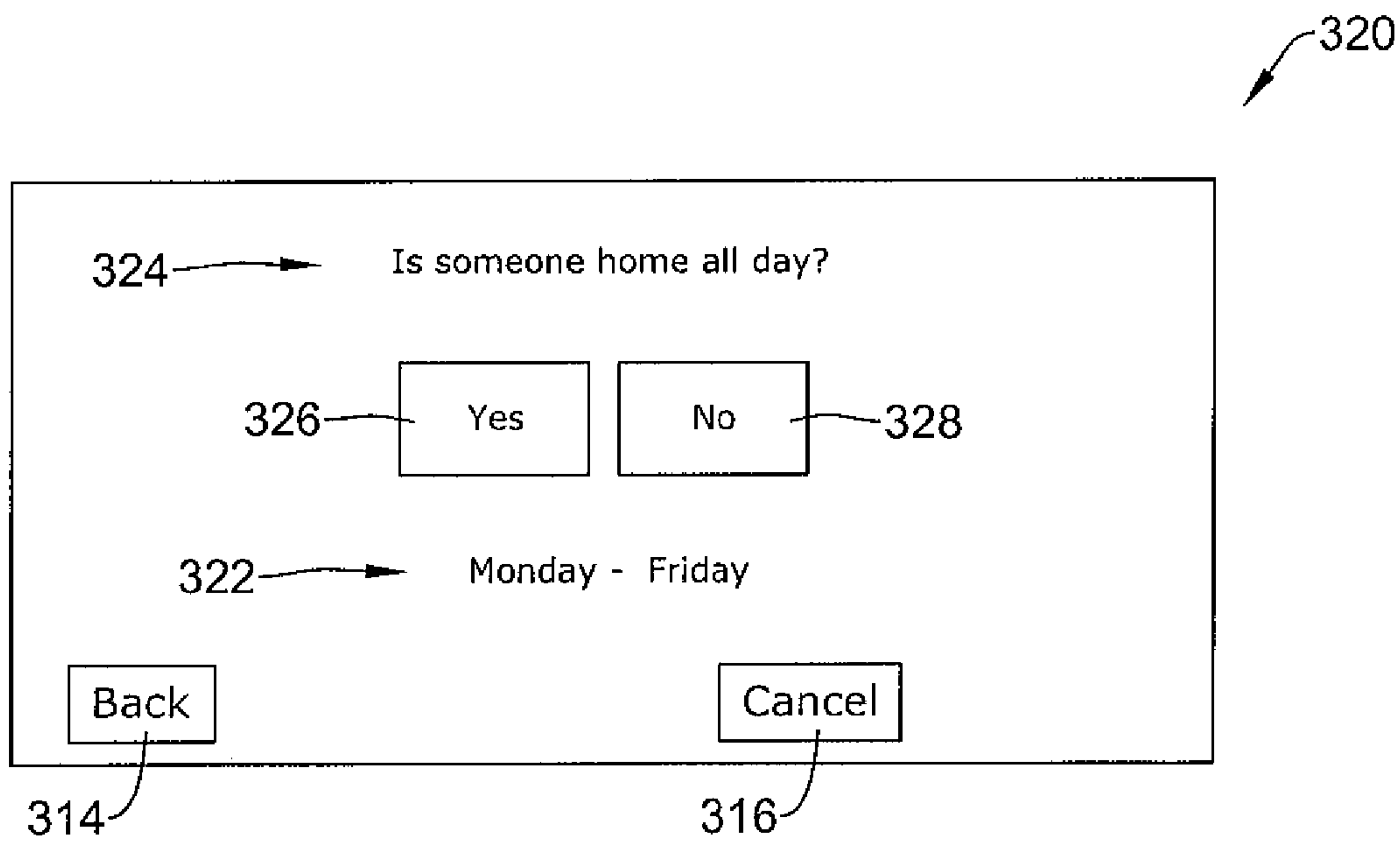


Figure 29

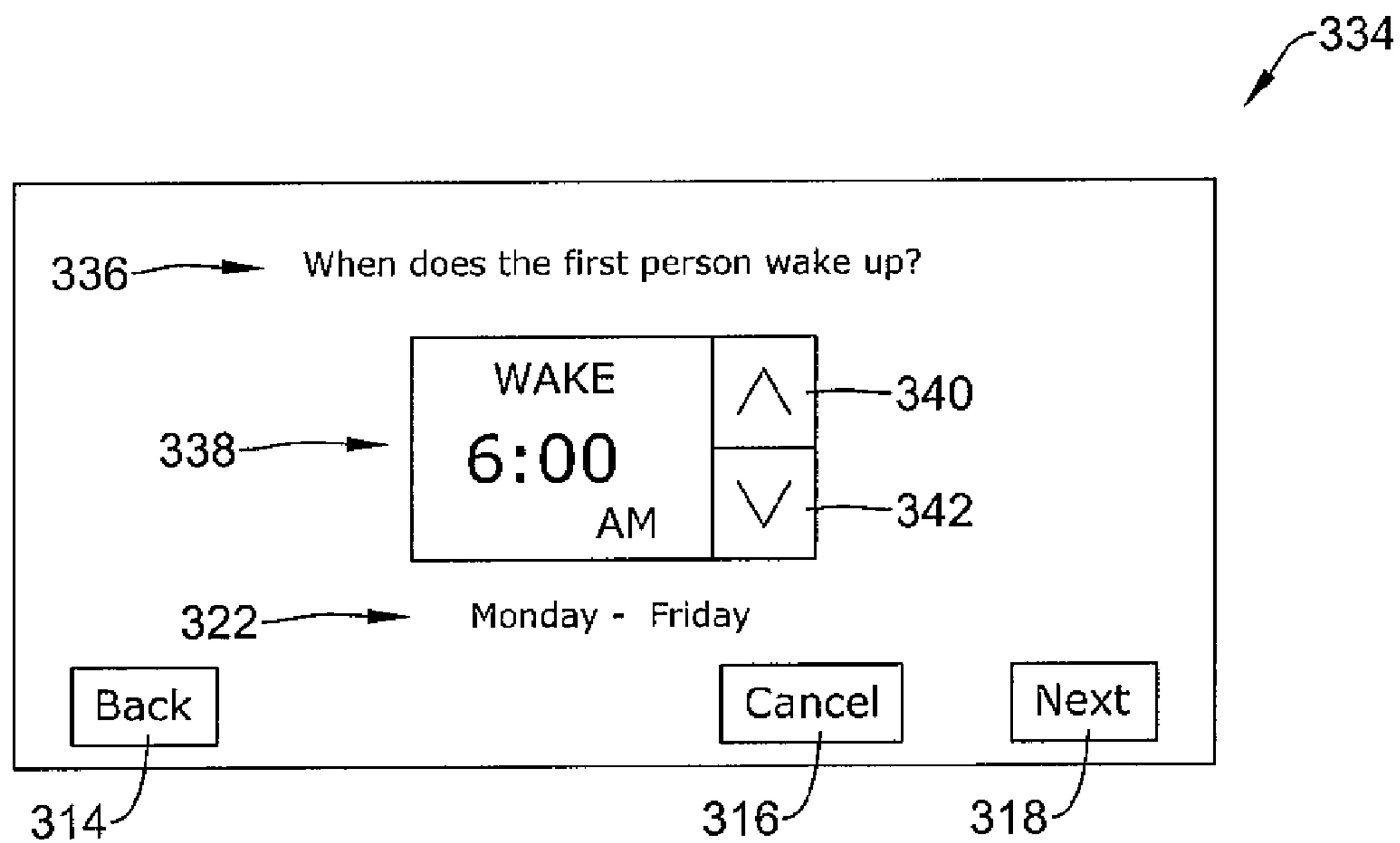


Figure 30

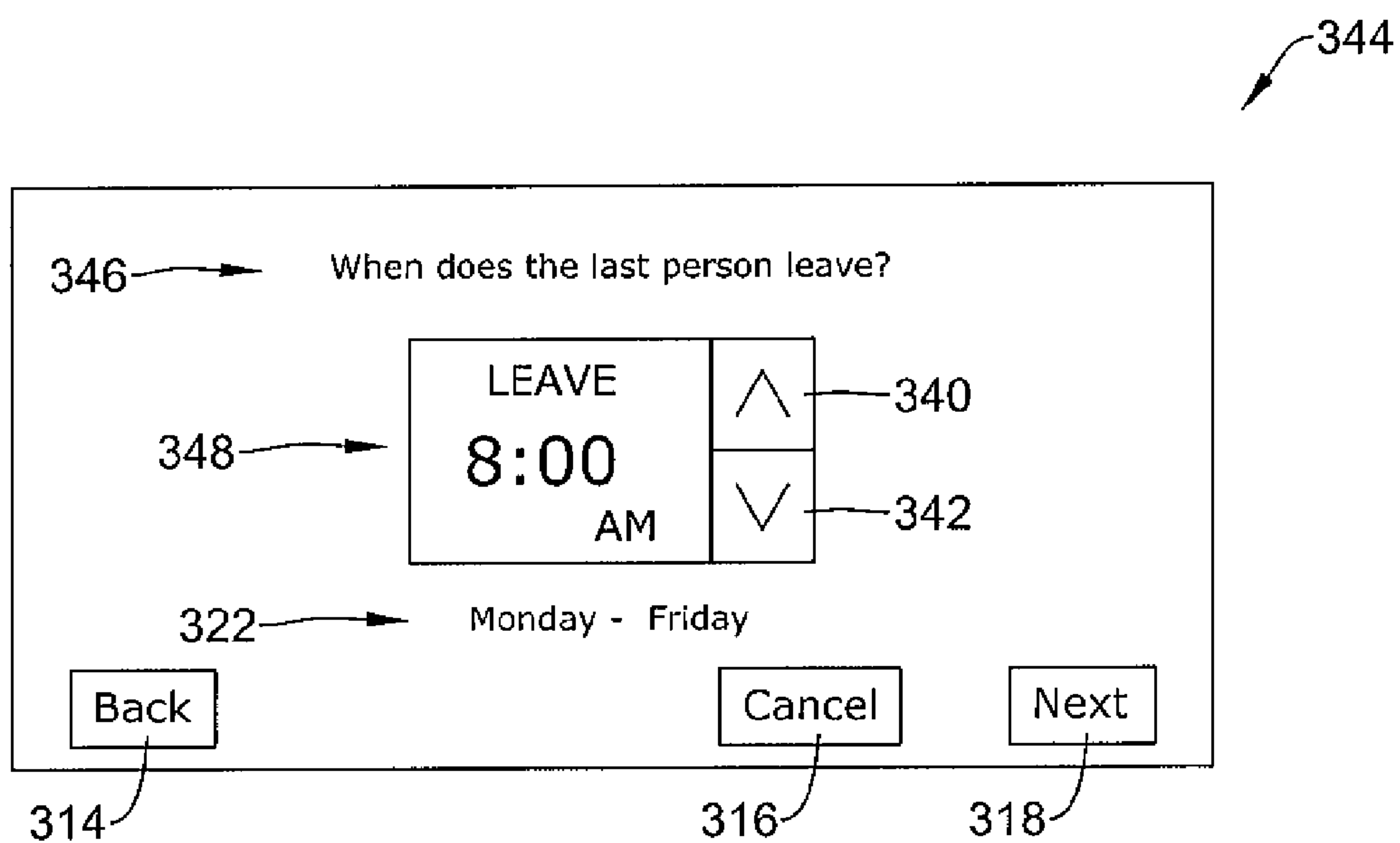


Figure 31

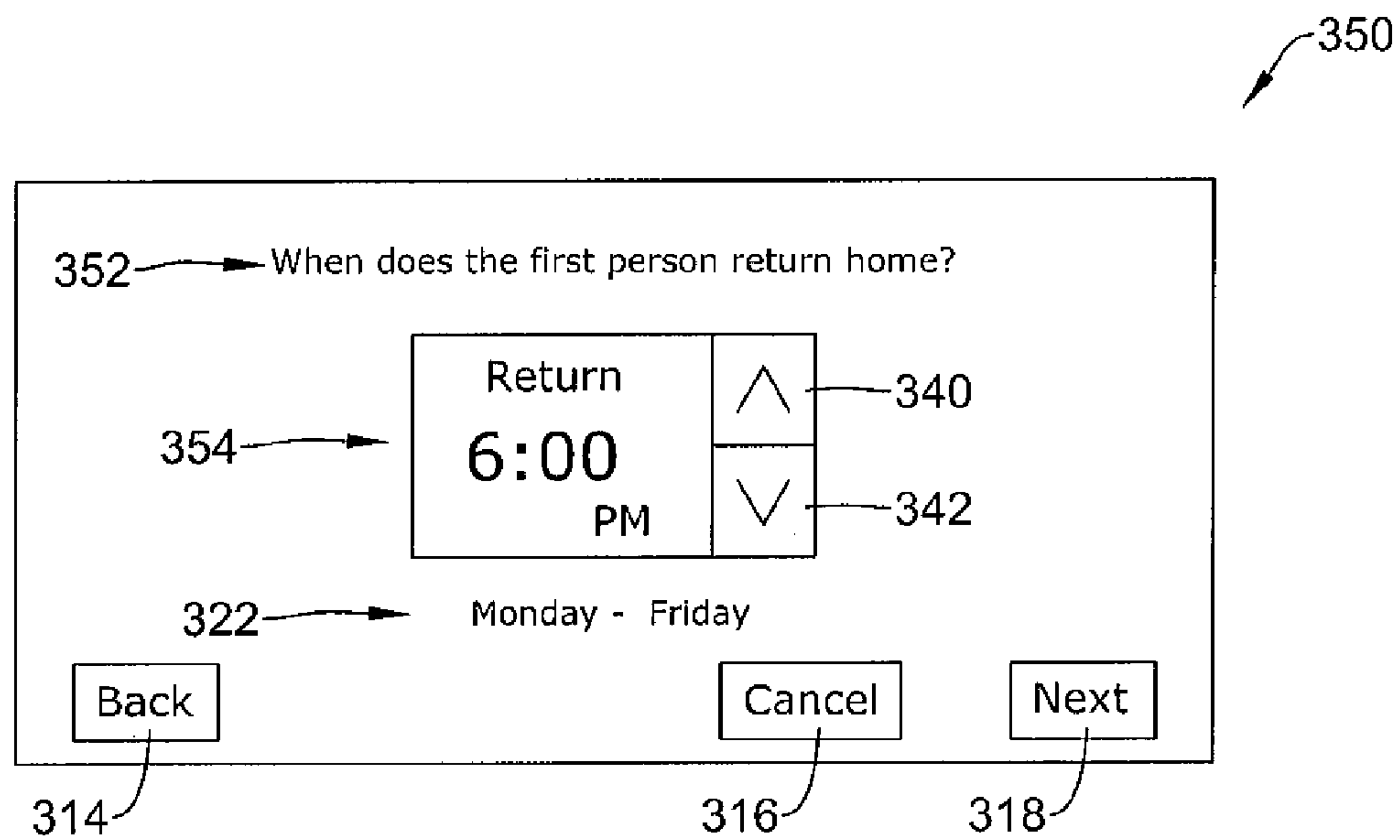


Figure 32

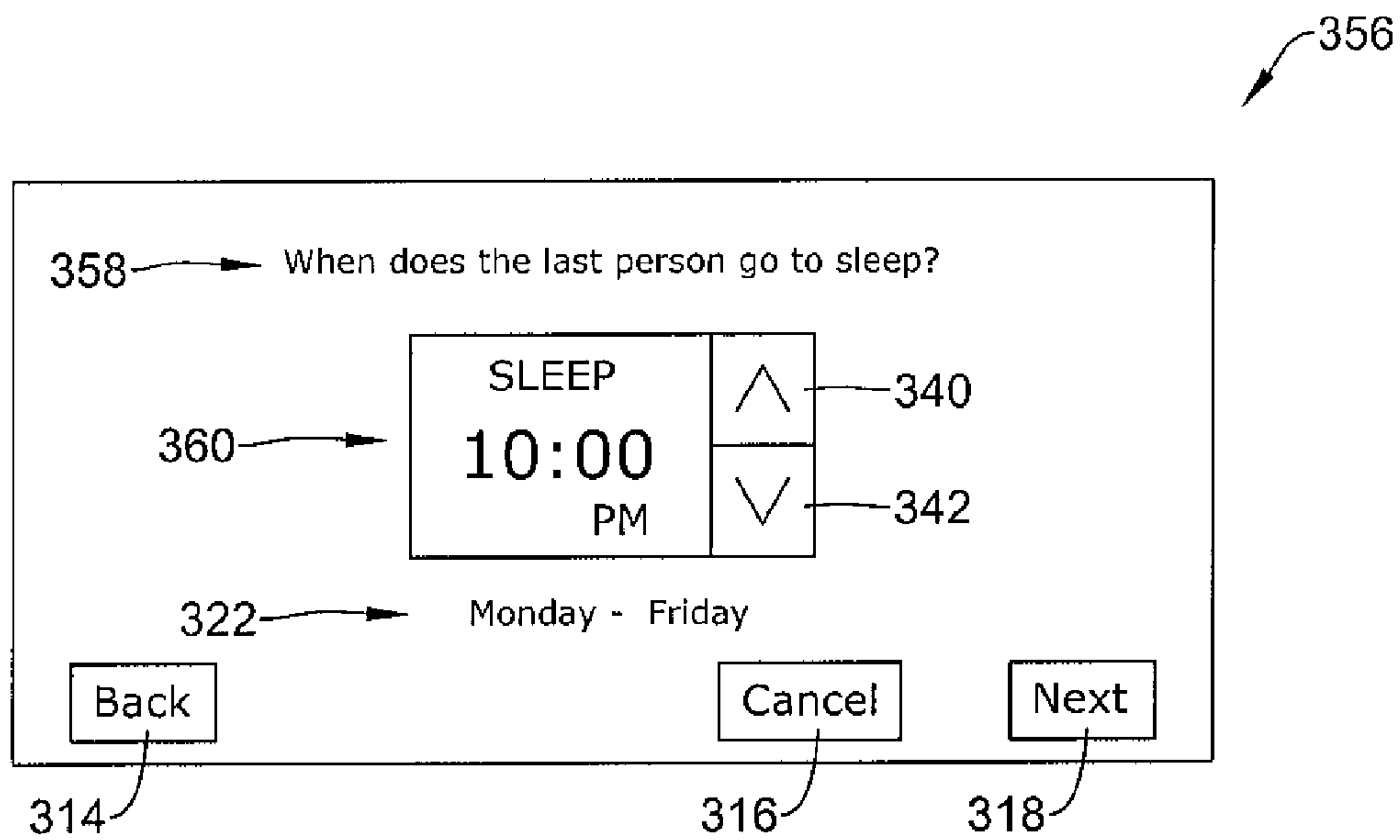
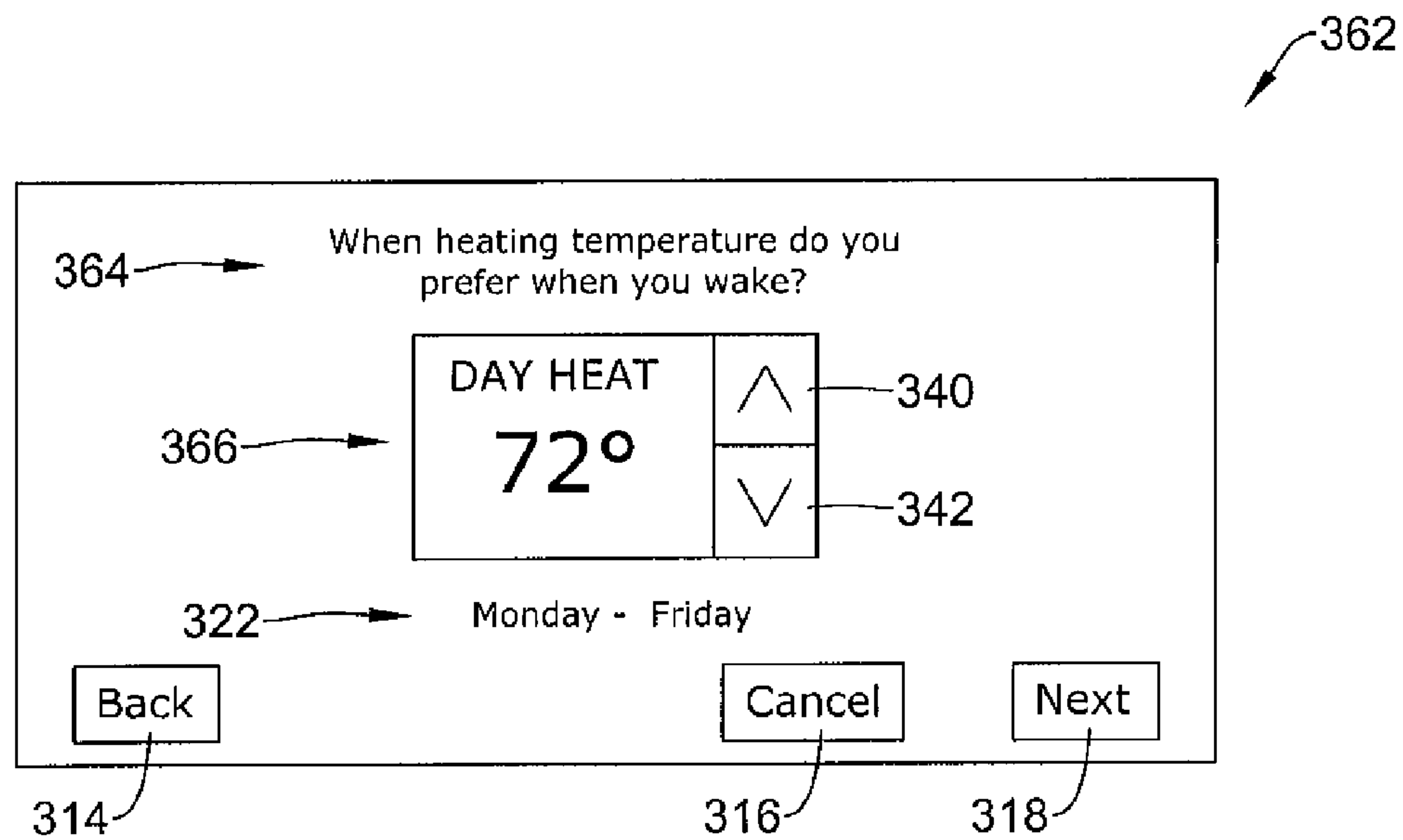
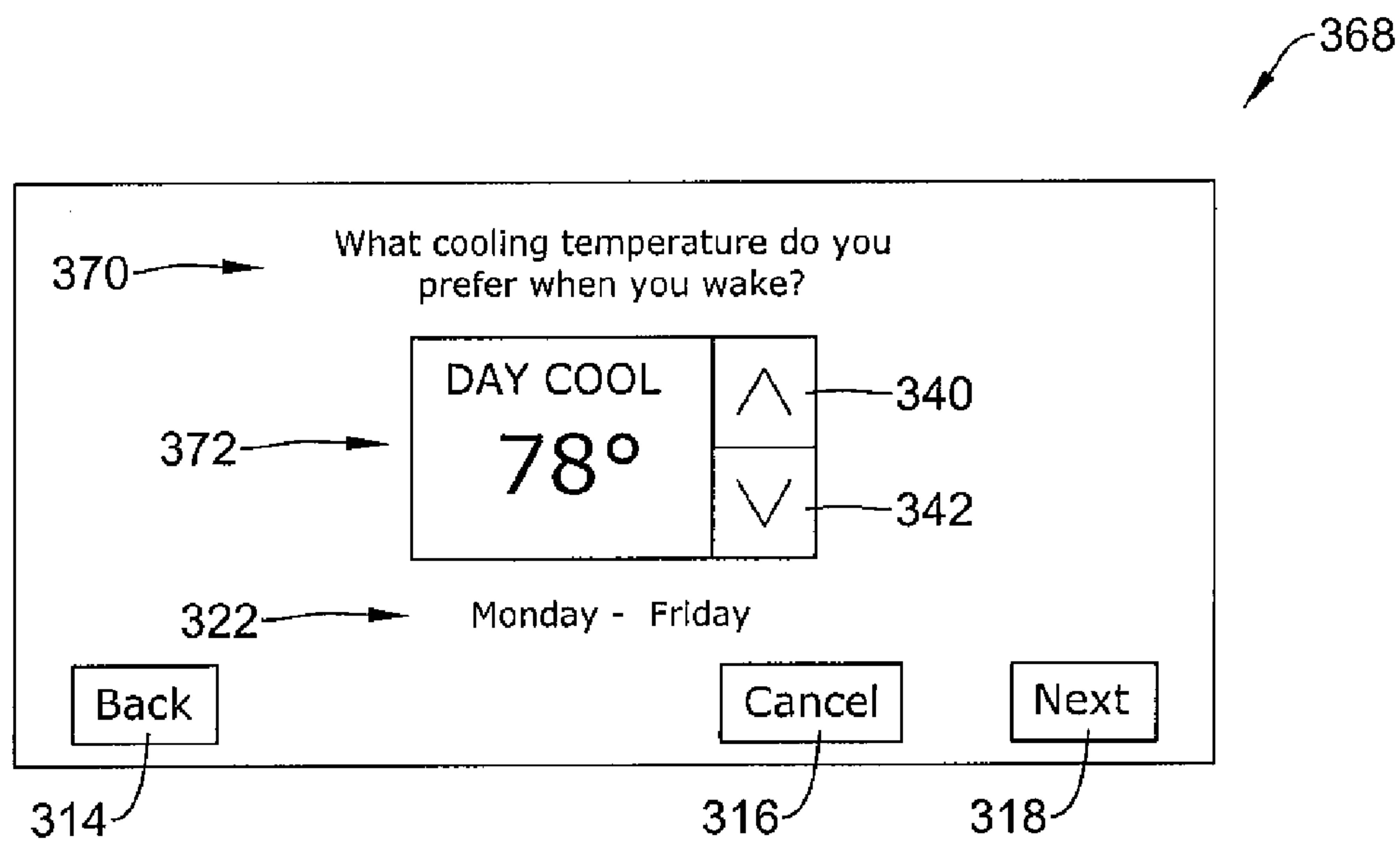


Figure 33

*Figure 34**Figure 35*

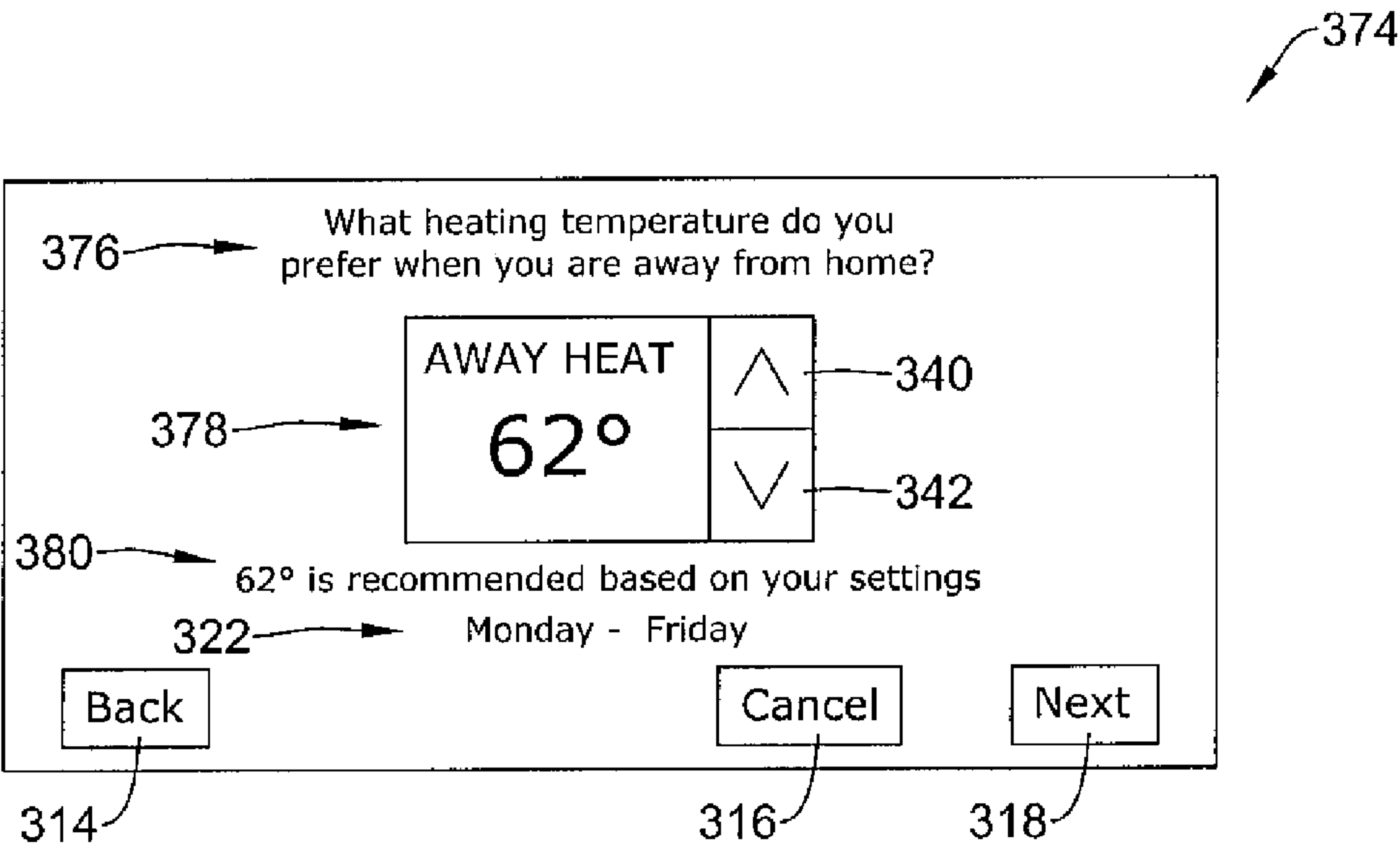


Figure 36

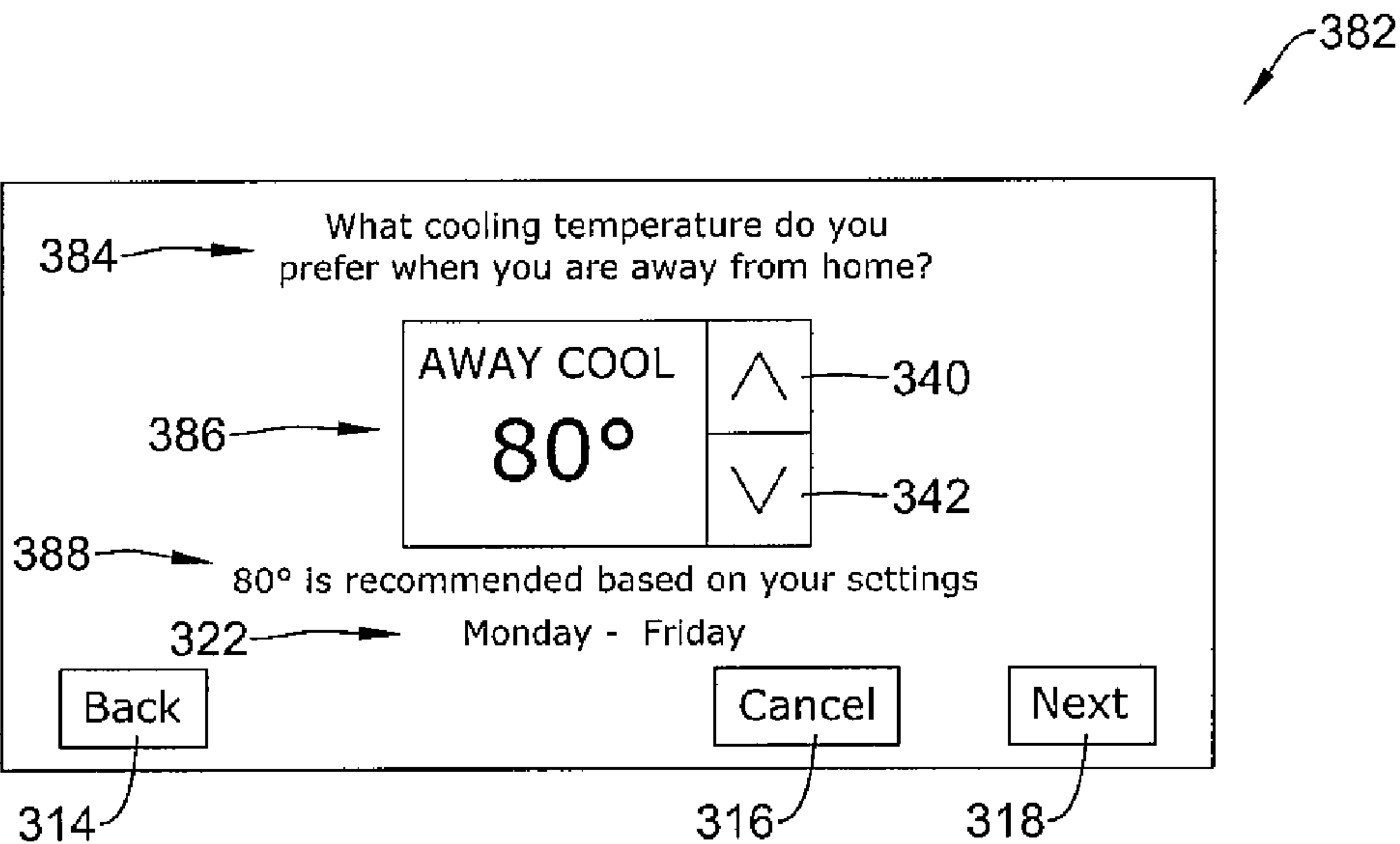


Figure 37

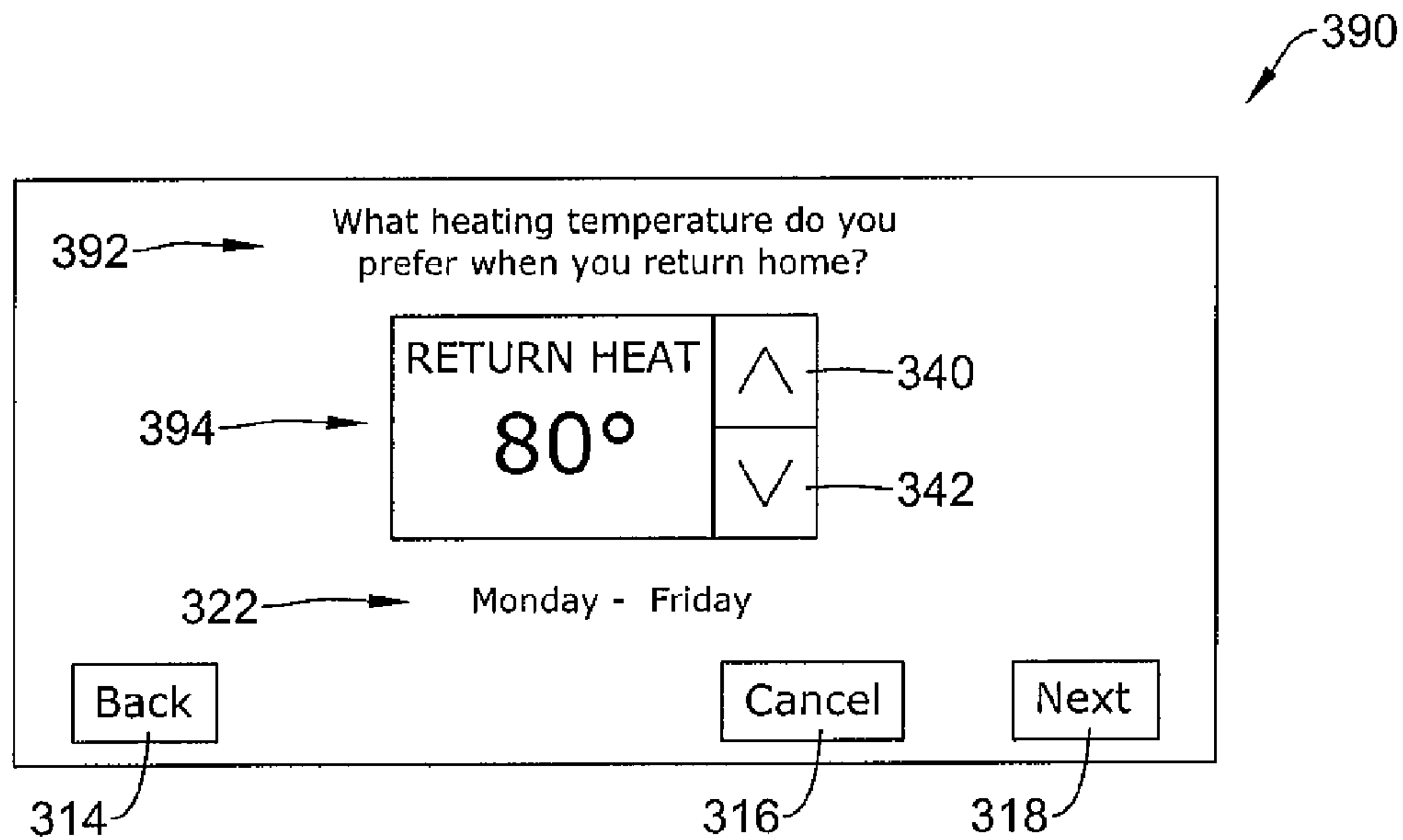


Figure 38

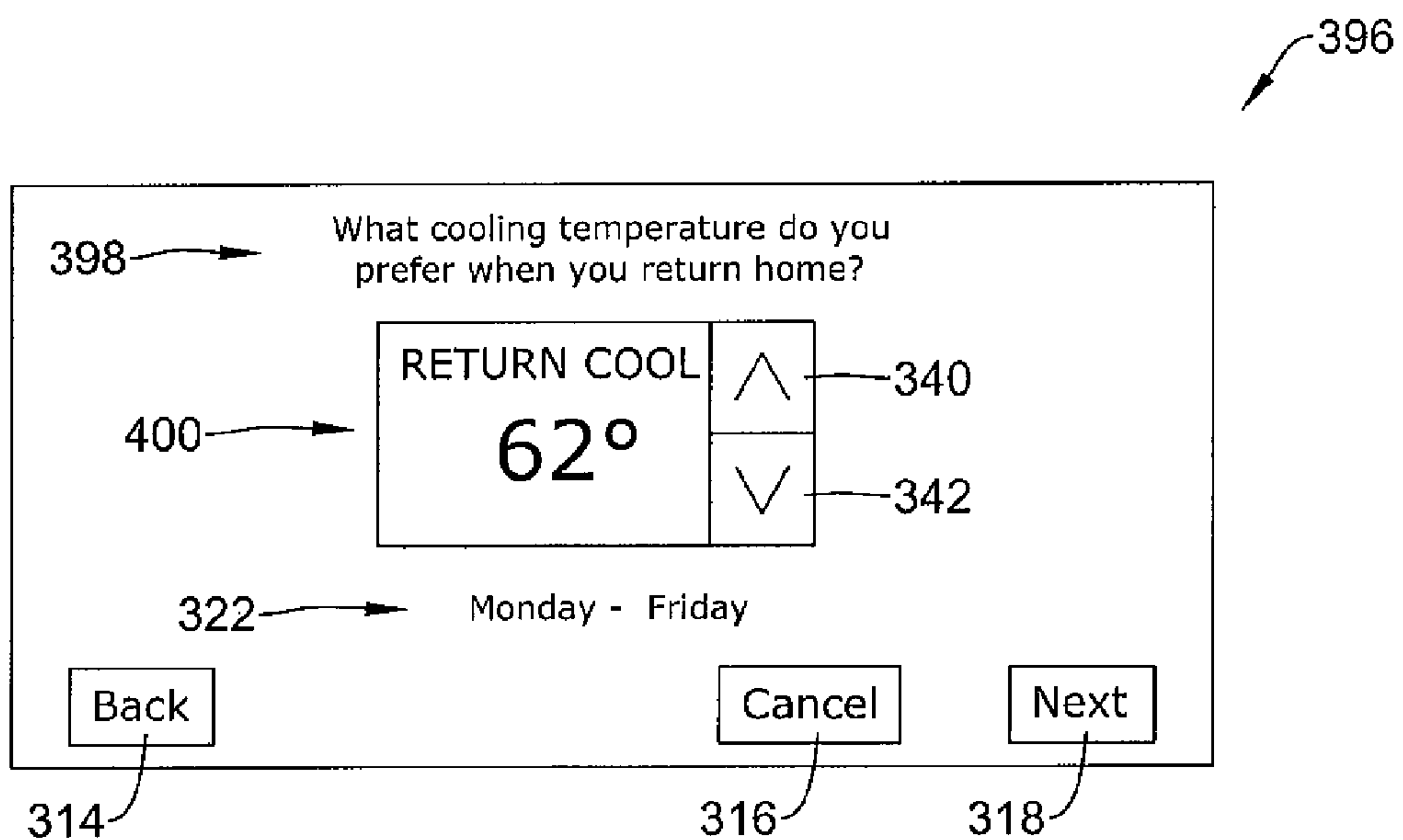
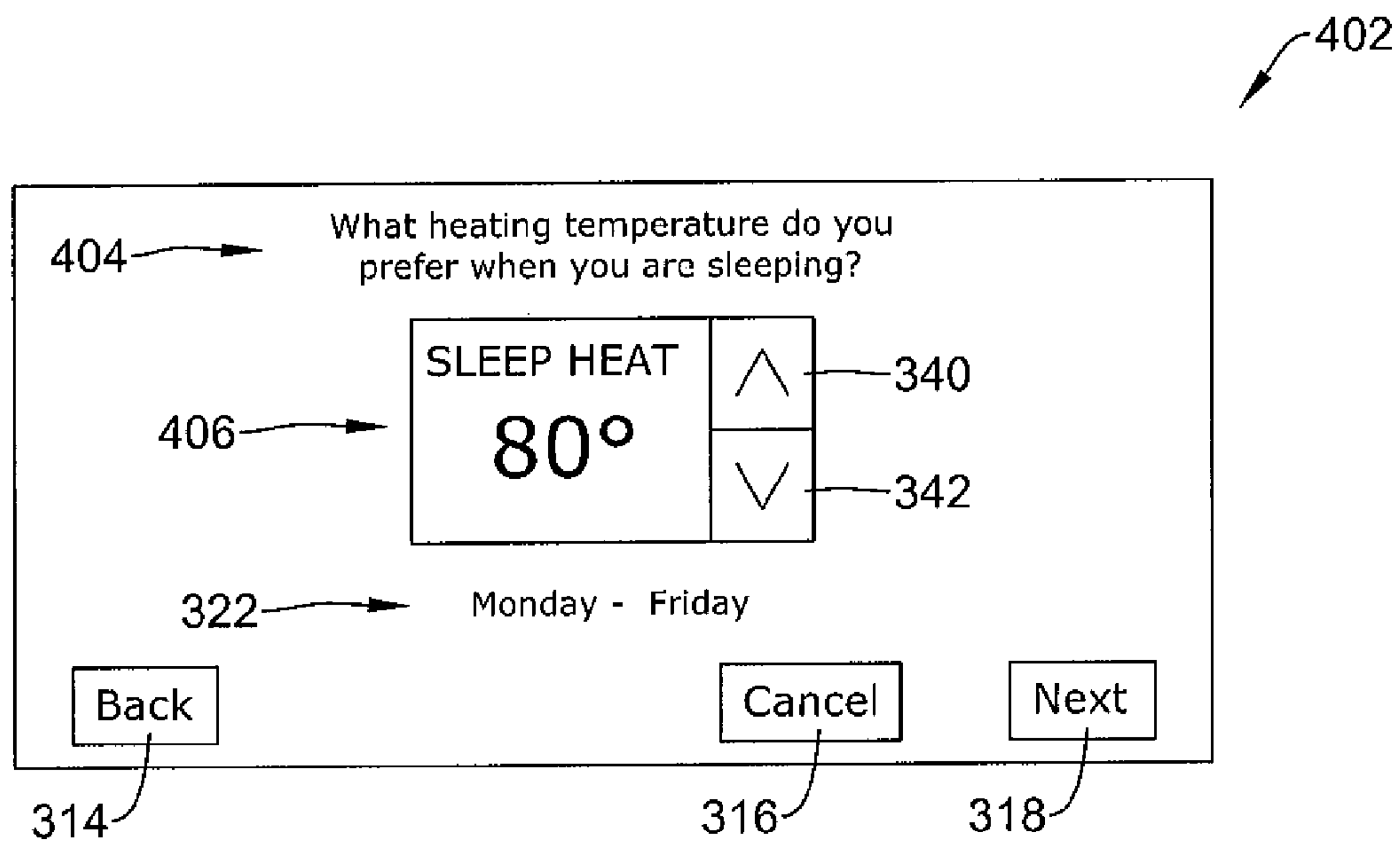
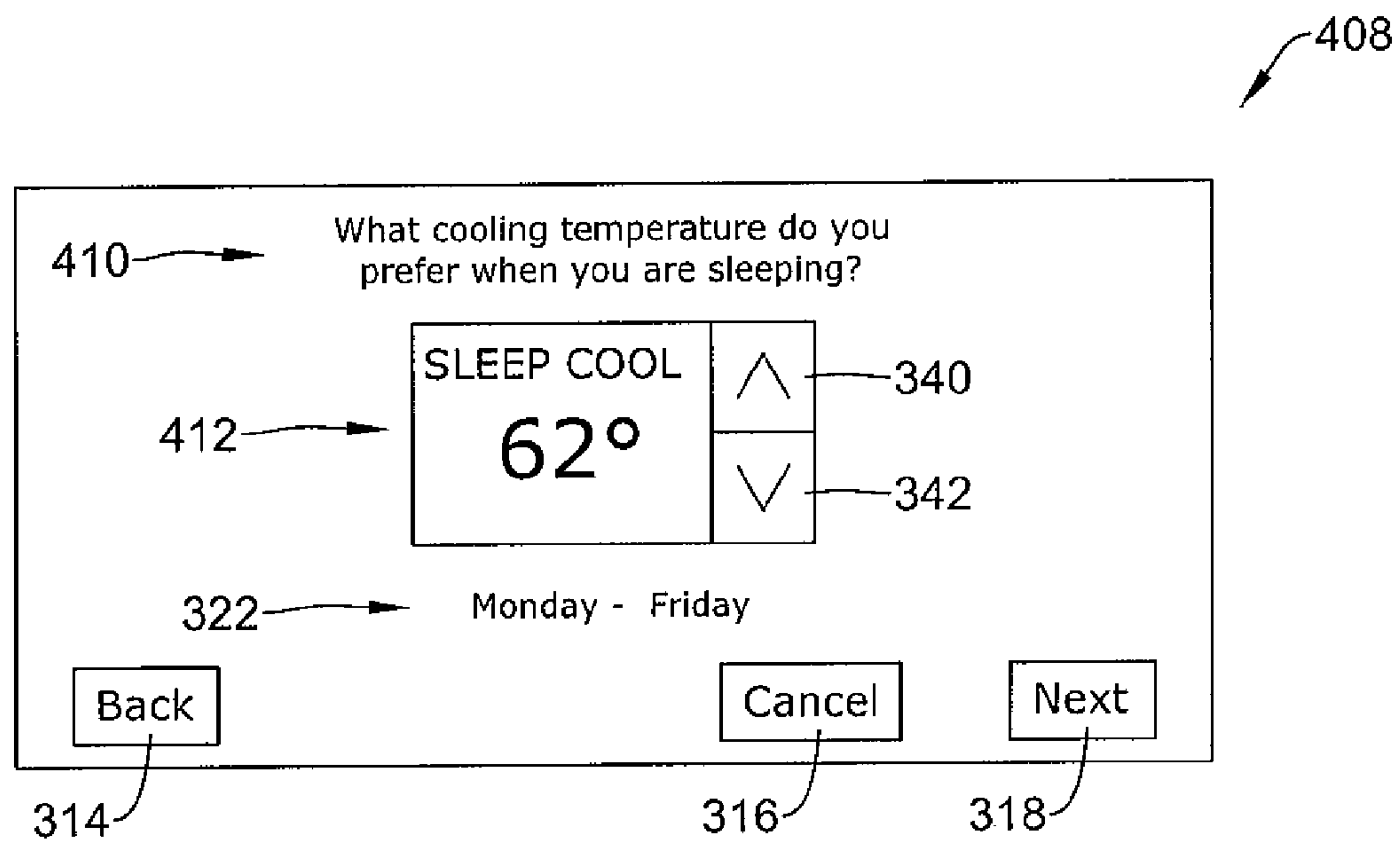


Figure 39

*Figure 40**Figure 41*

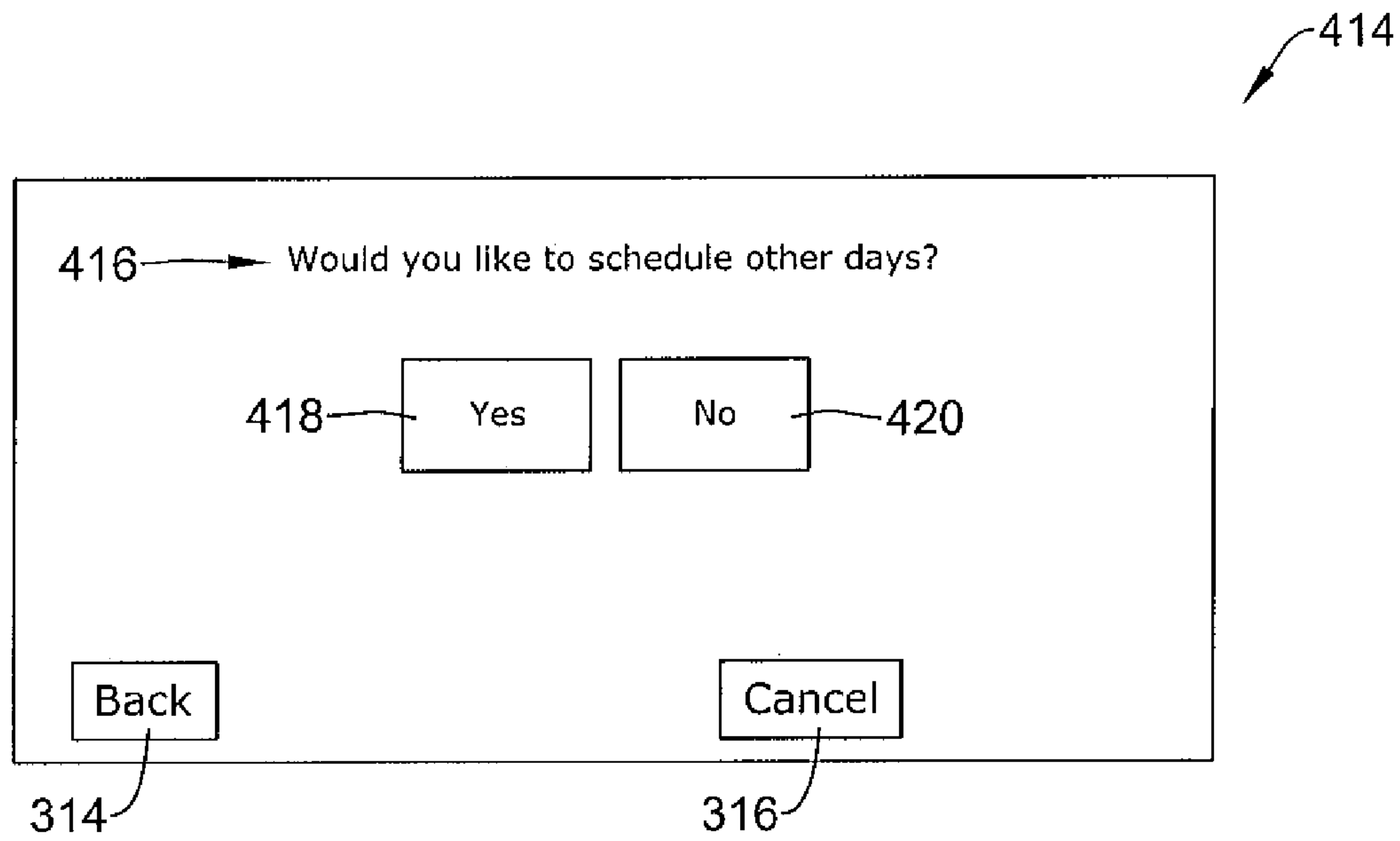


Figure 42

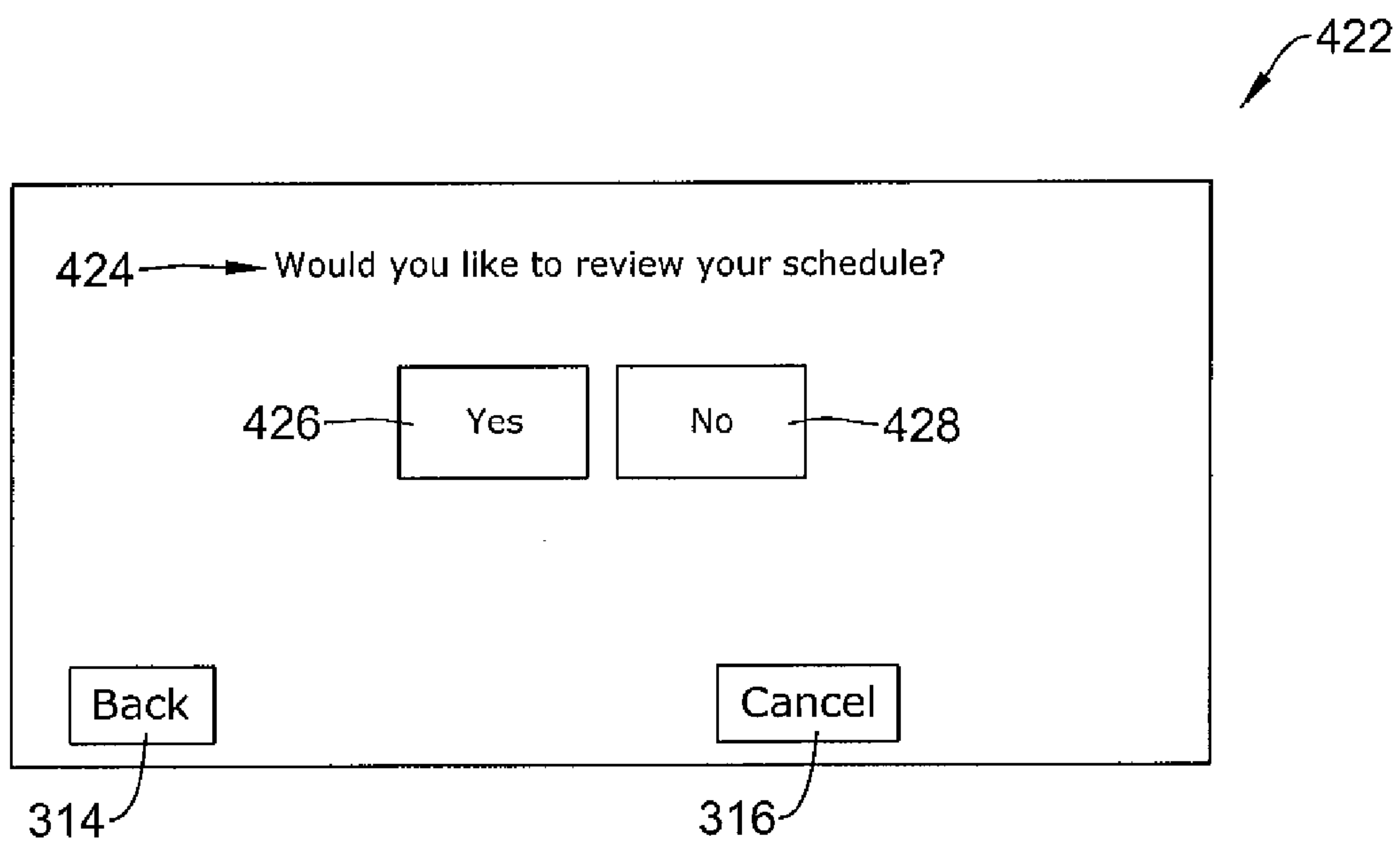


Figure 43

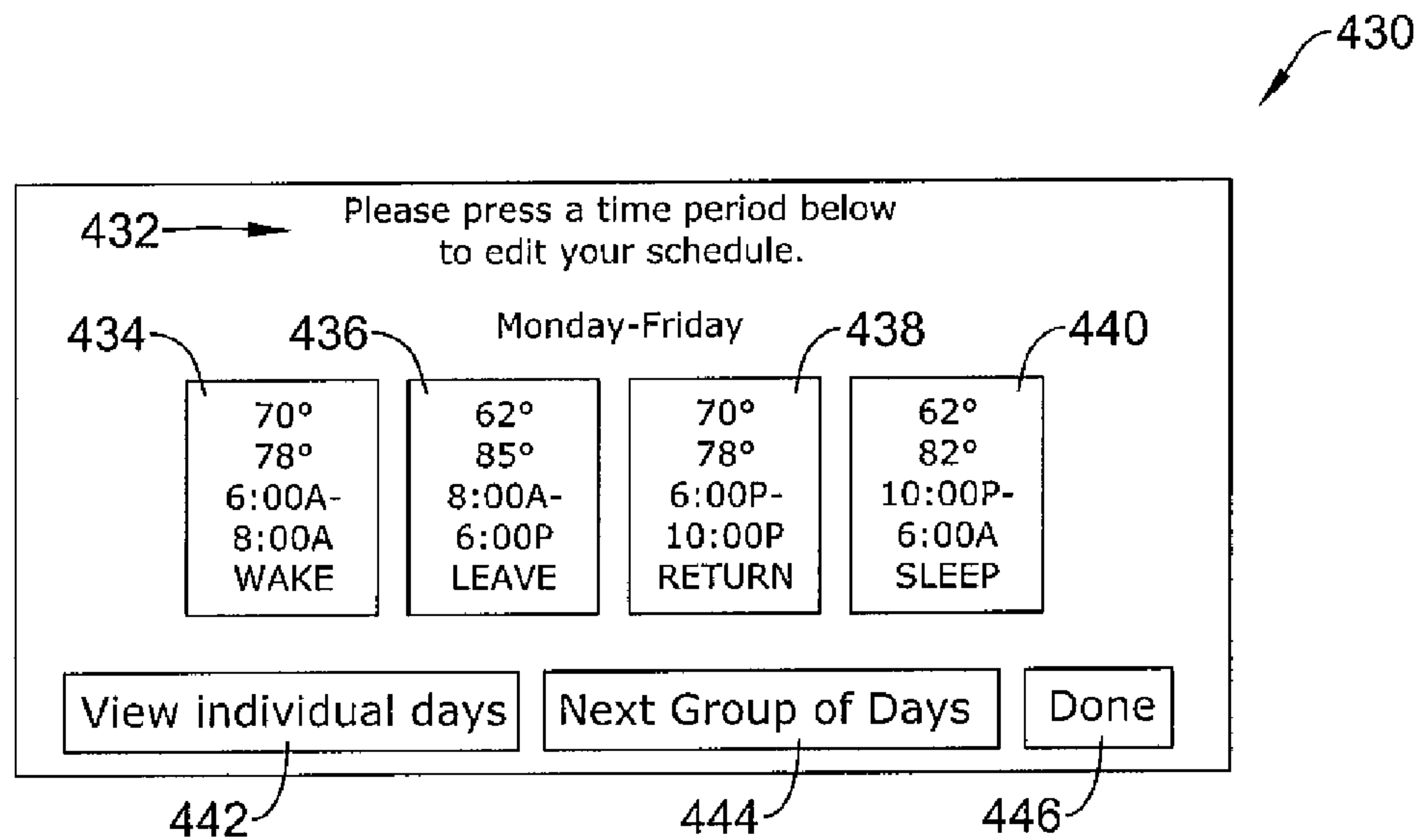


Figure 44

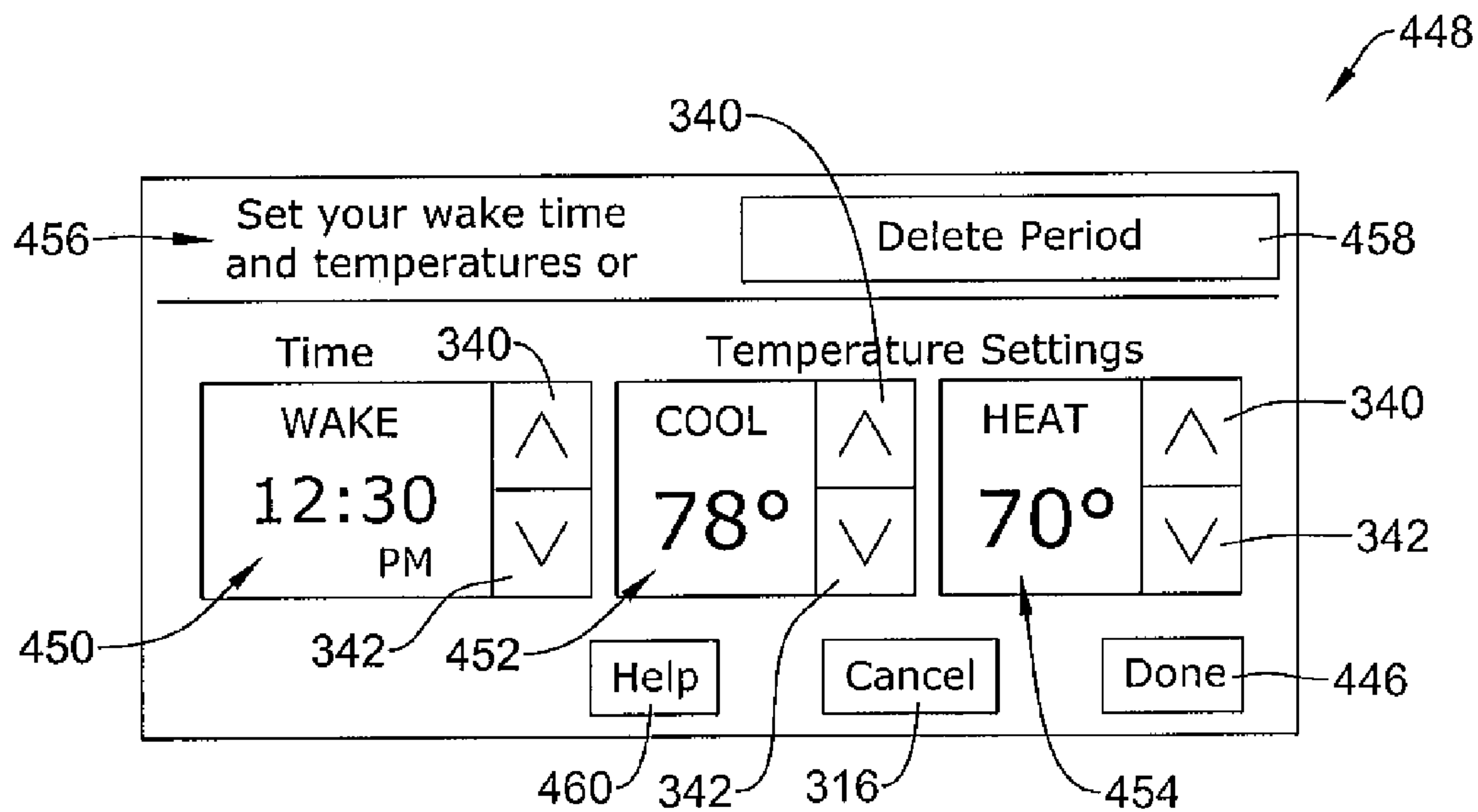


Figure 45

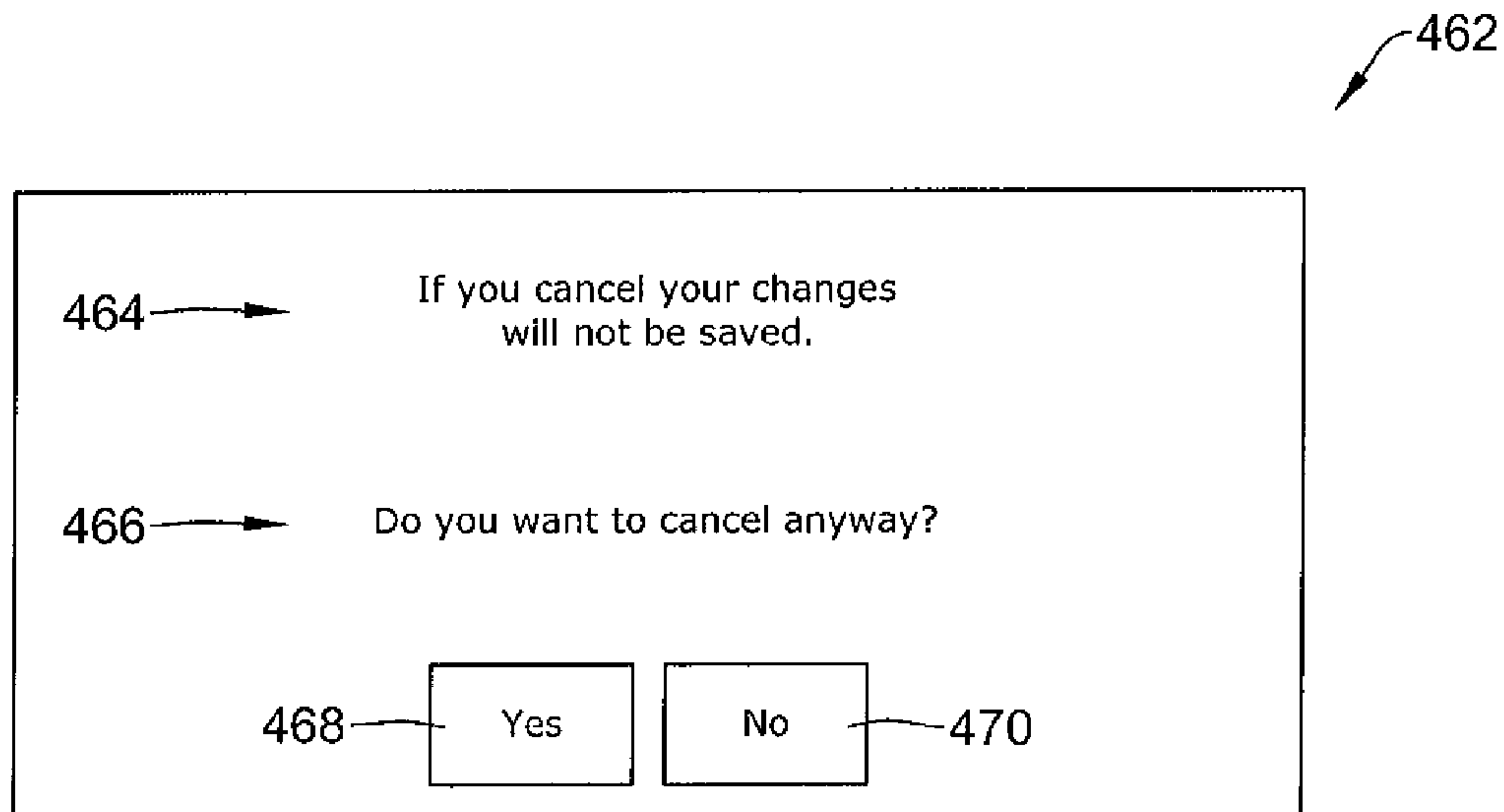


Figure 46

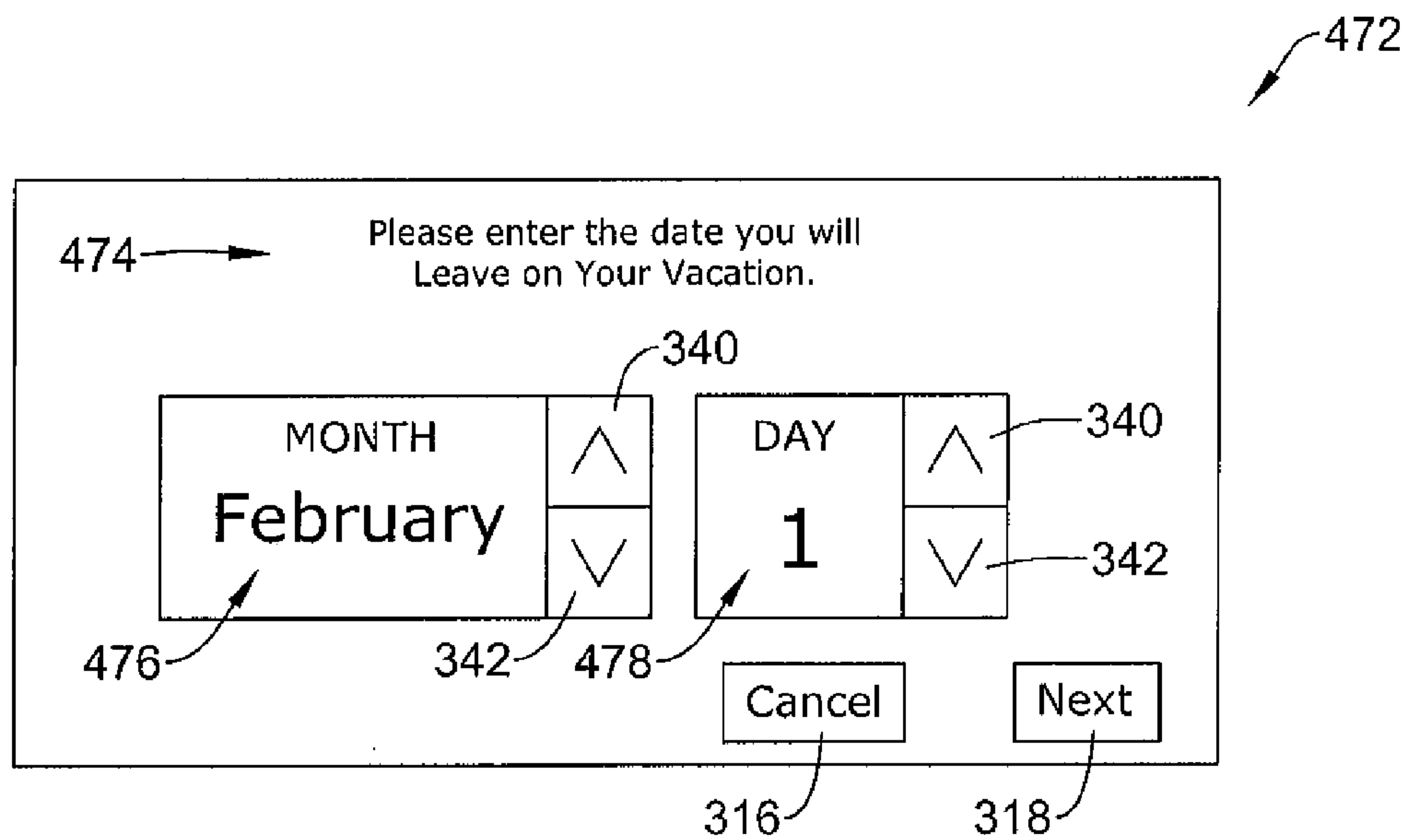


Figure 47

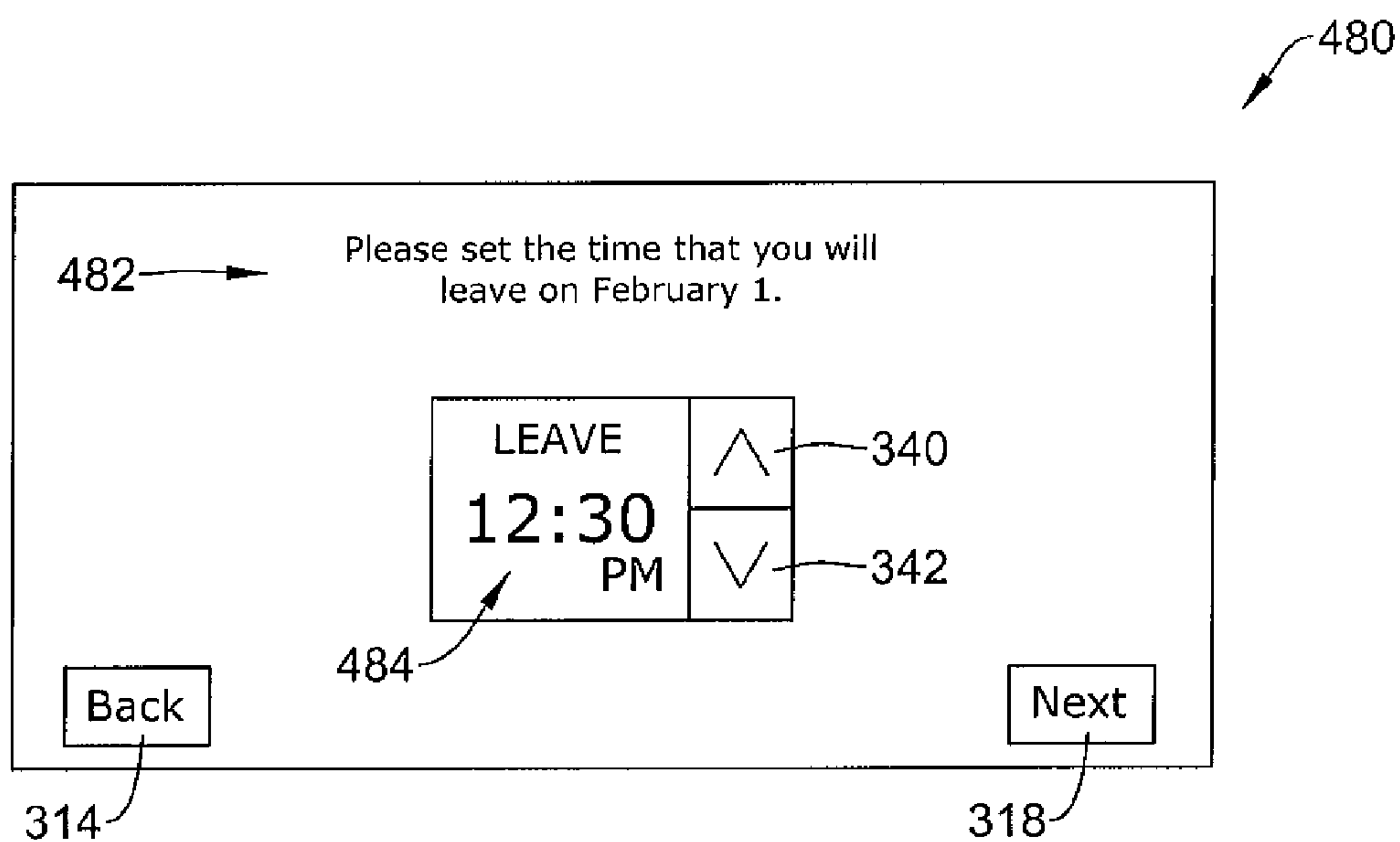


Figure 48

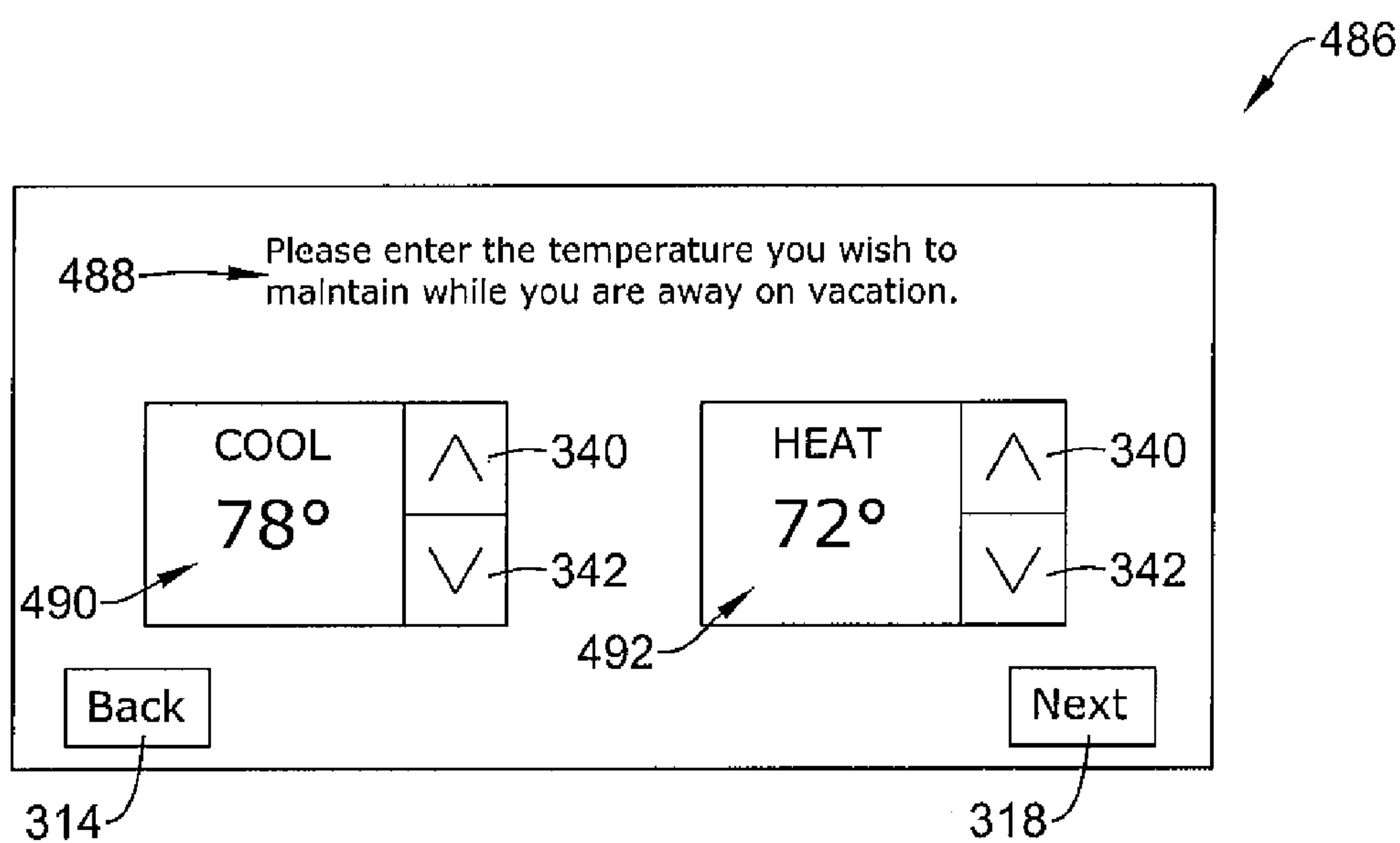


Figure 49

494

496 → Please enter the date you will
Return from your Vacation.

MONTH

February

340
342

DAY

3

340
342

Back

Next

314 318

Figure 50

502

504 → Please set the time that you will
Return on February 3.

RETURN

12:30

PM

340
342

Back

Next

314 318

Figure 51

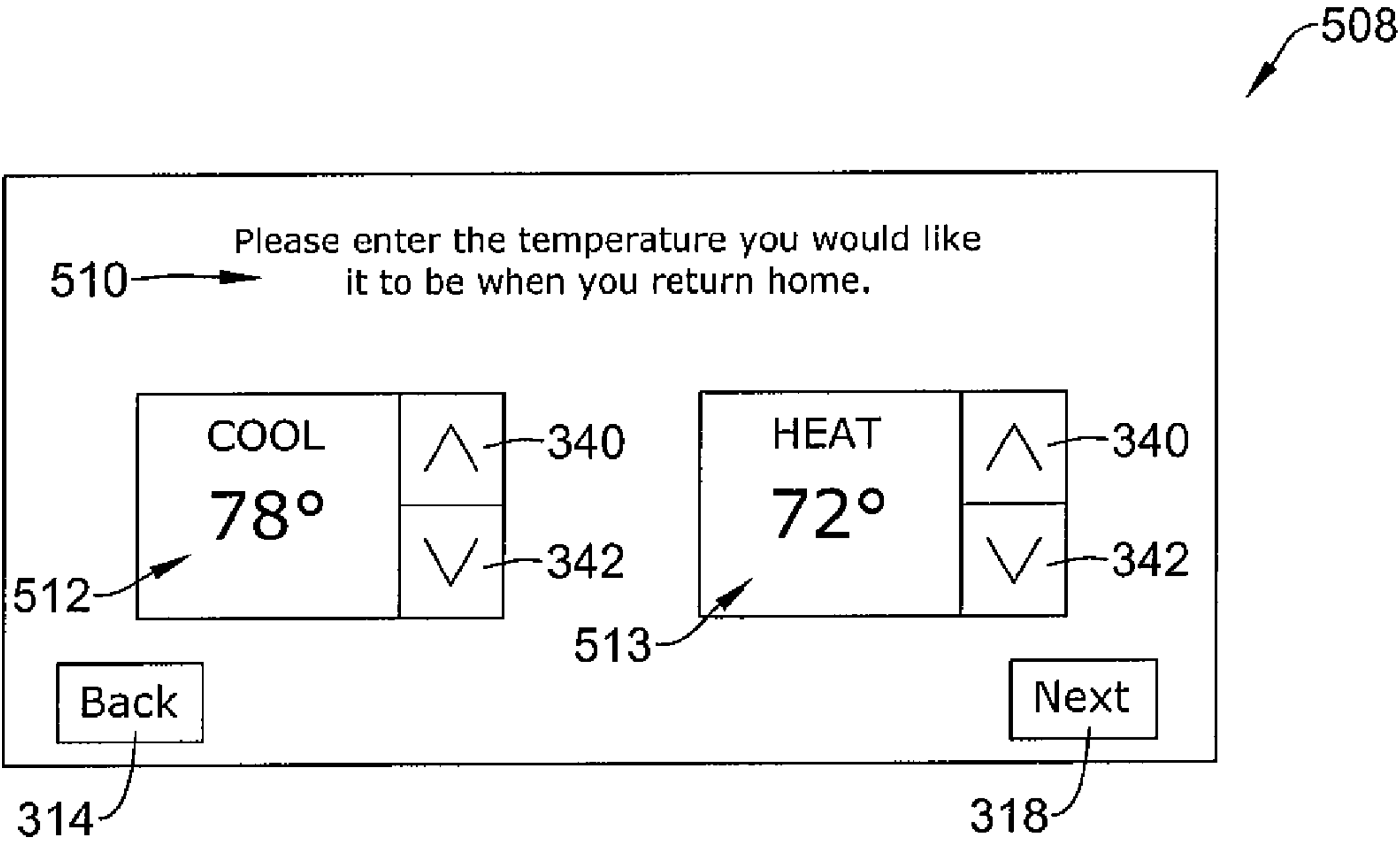


Figure 52

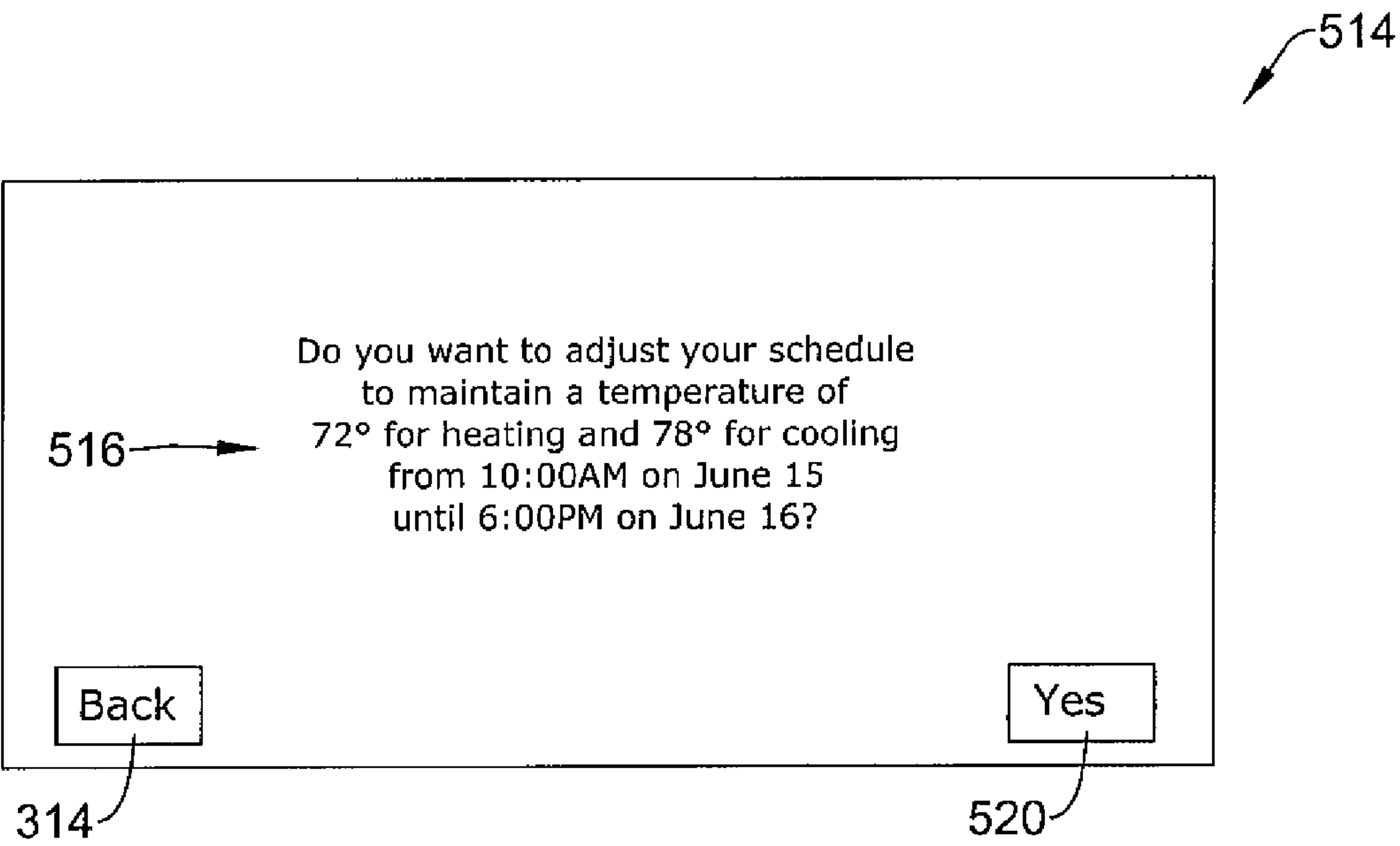
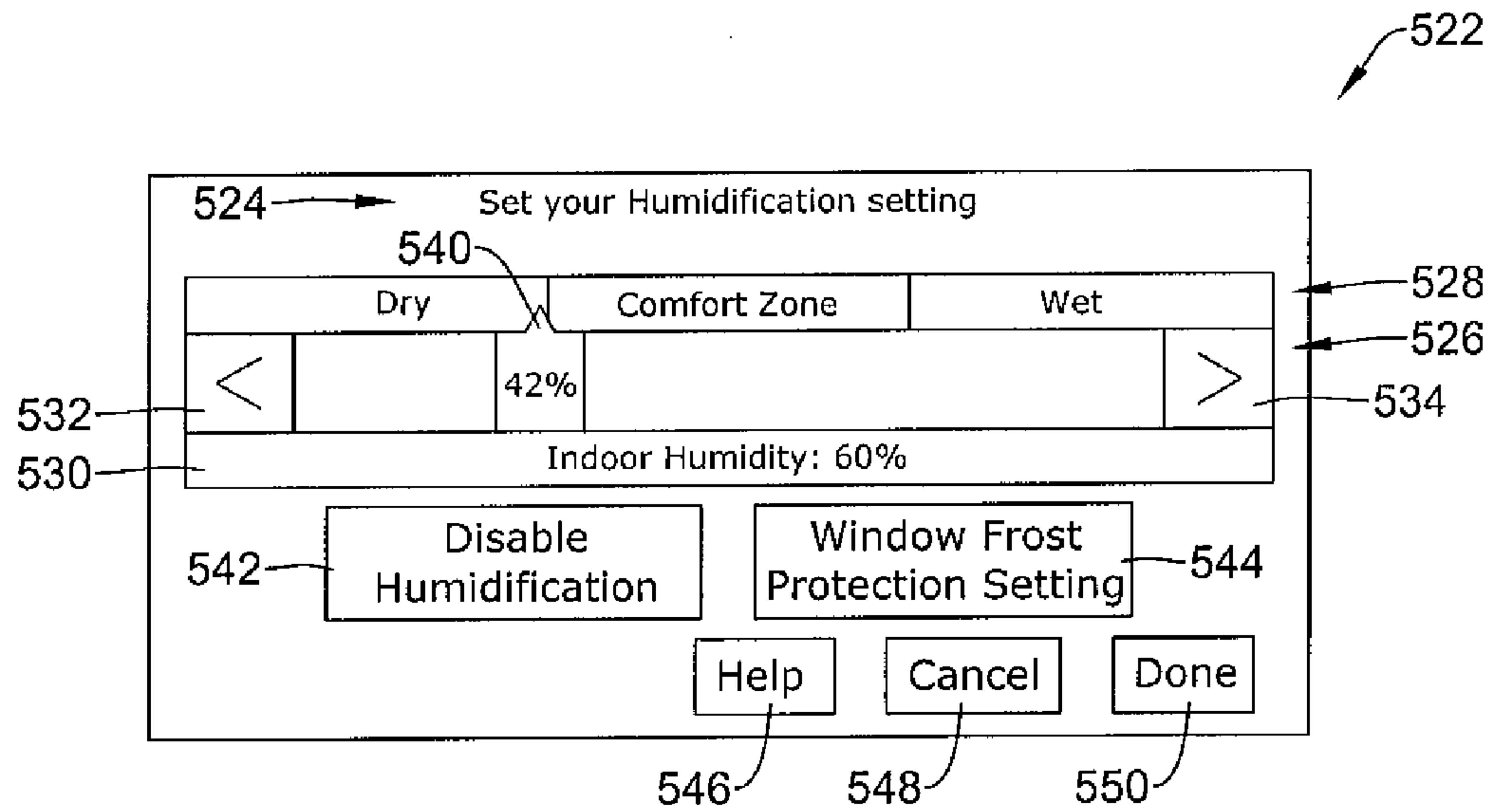
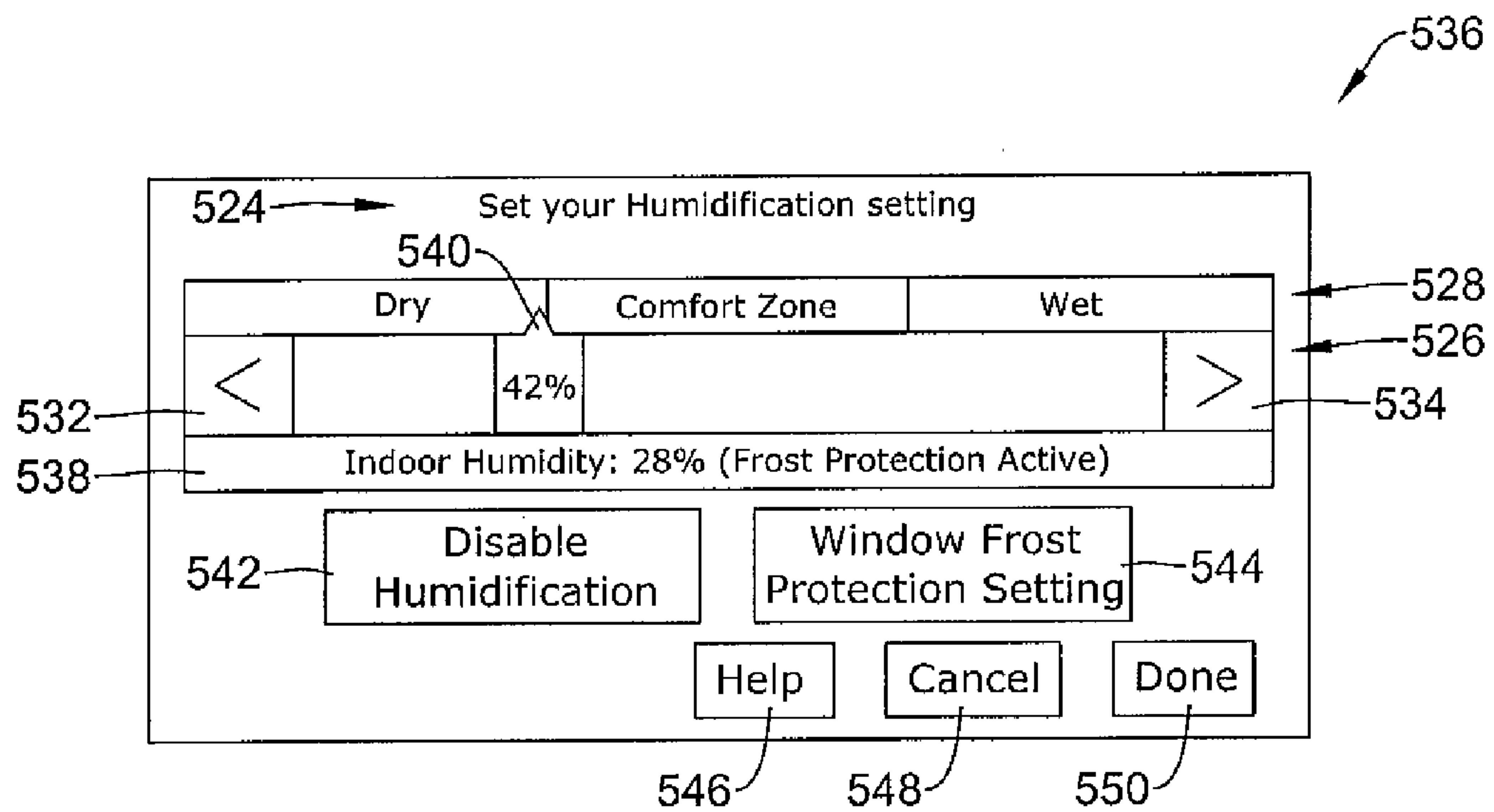


Figure 53

*Figure 54**Figure 55*

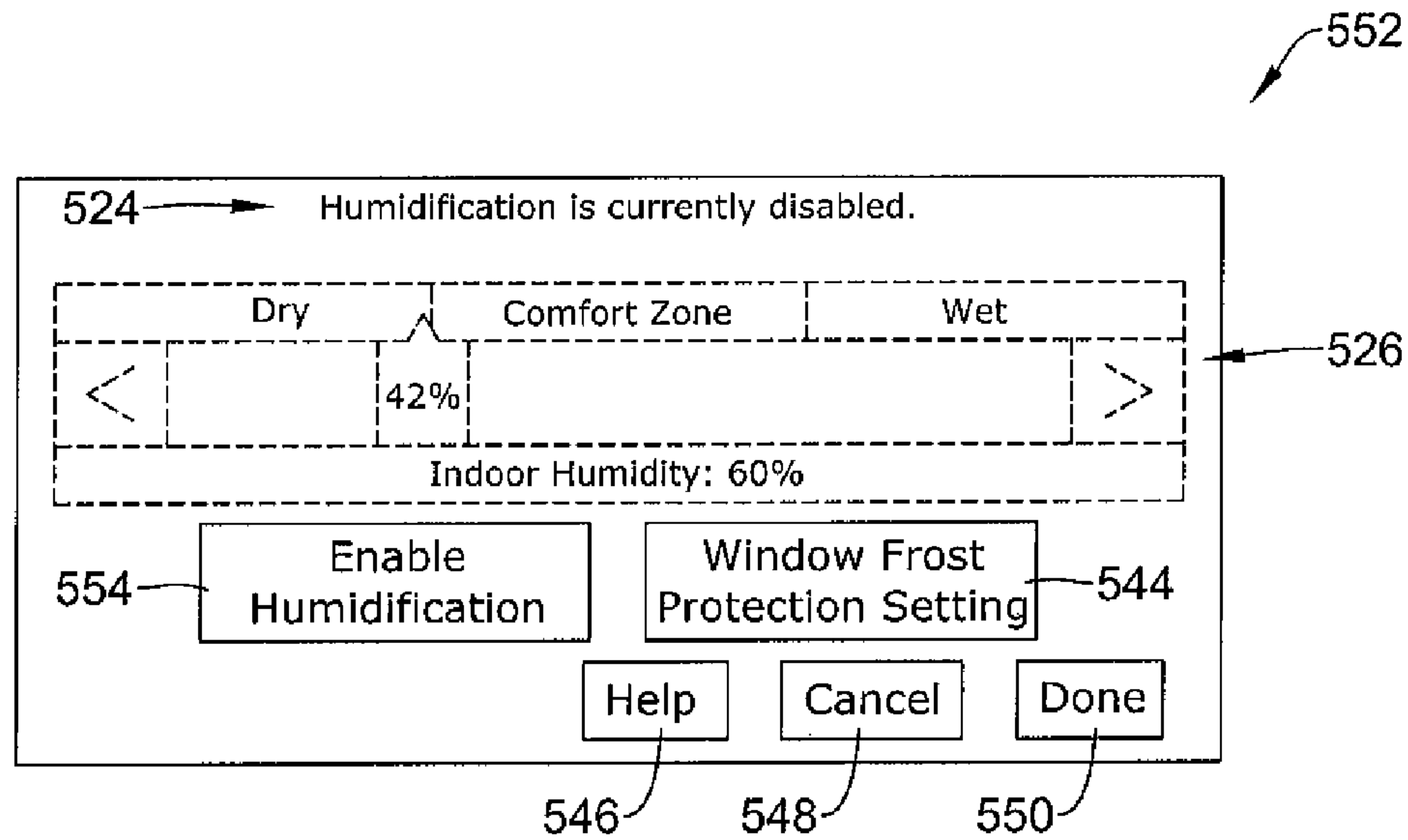


Figure 56

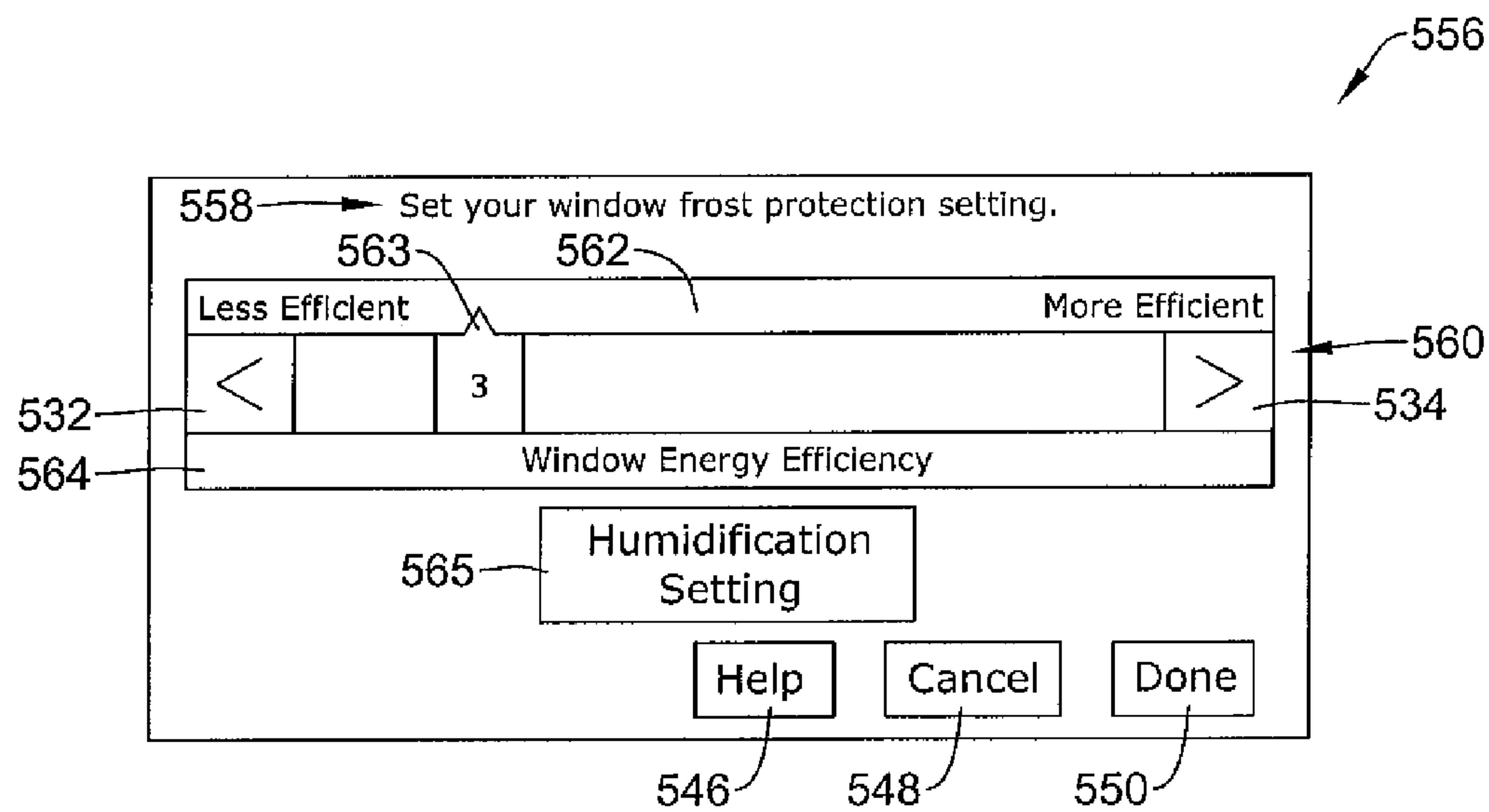


Figure 57

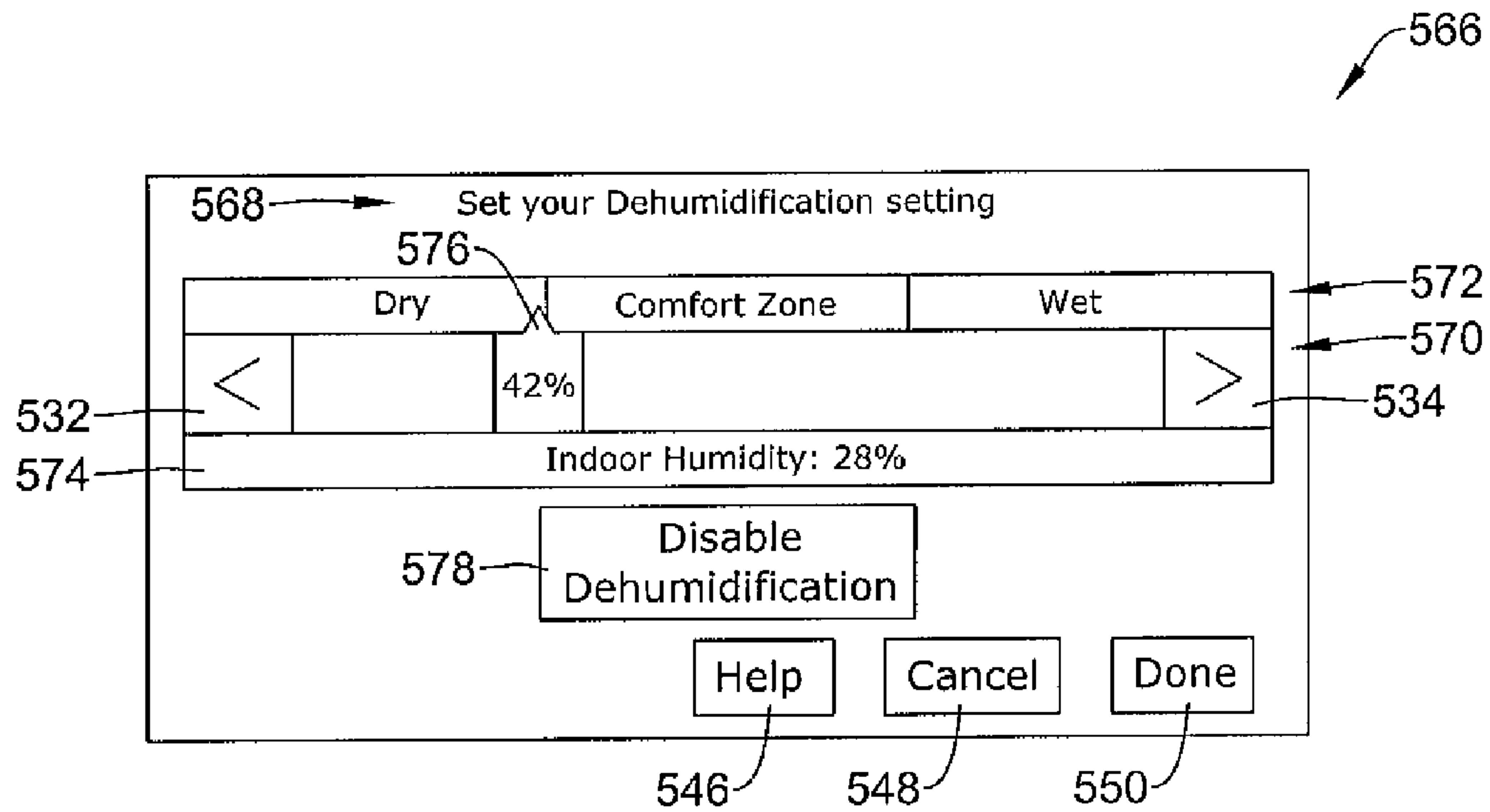


Figure 58

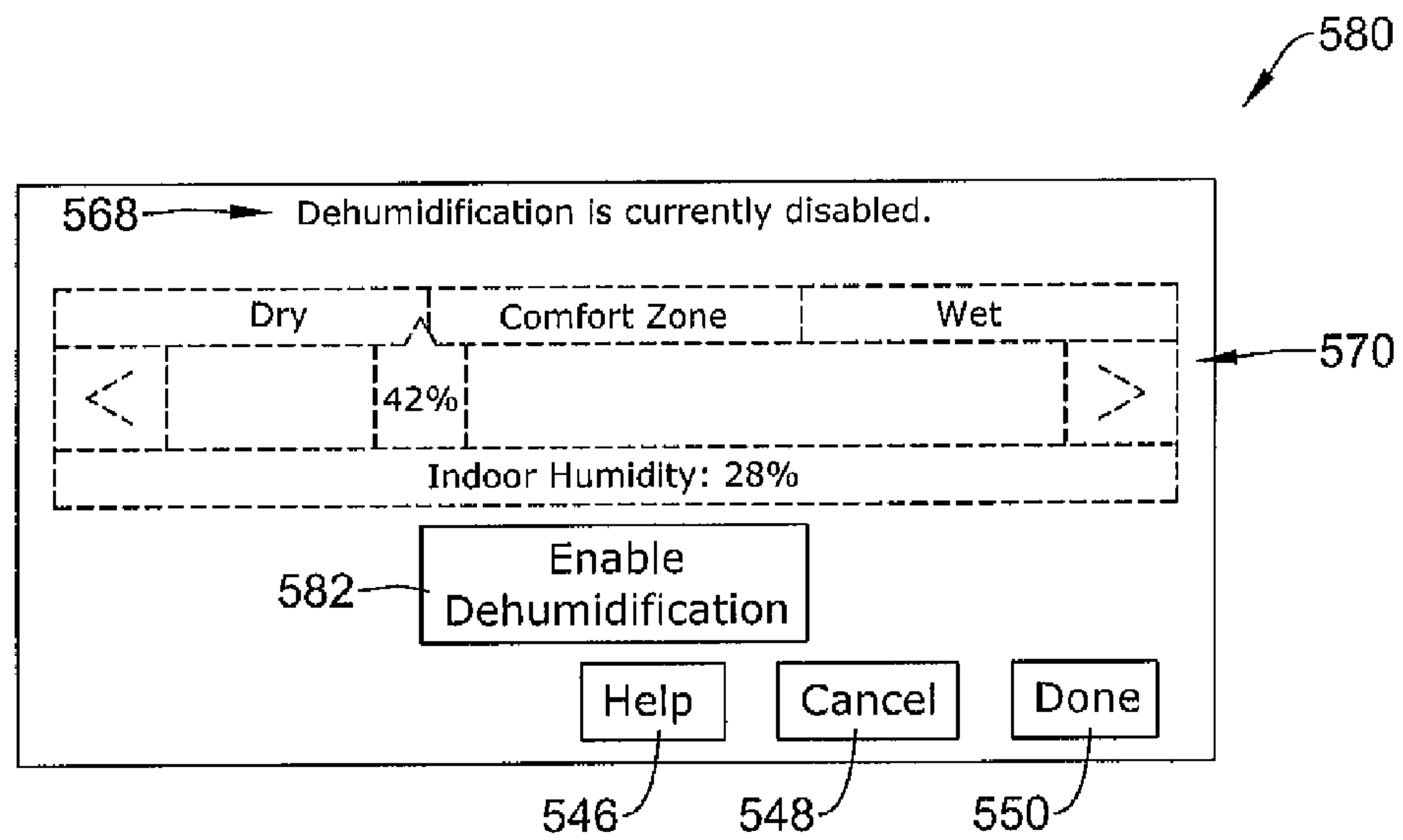
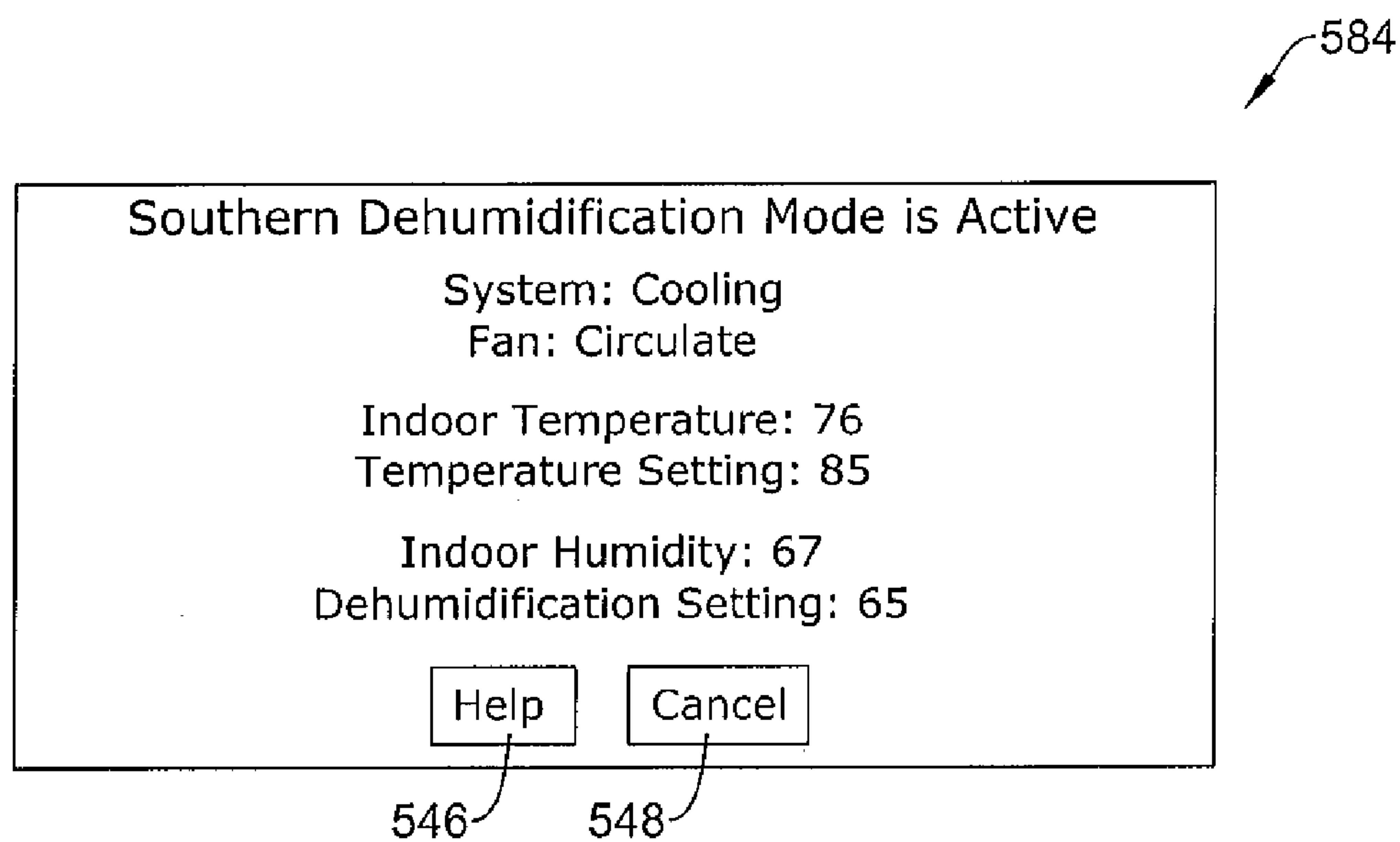
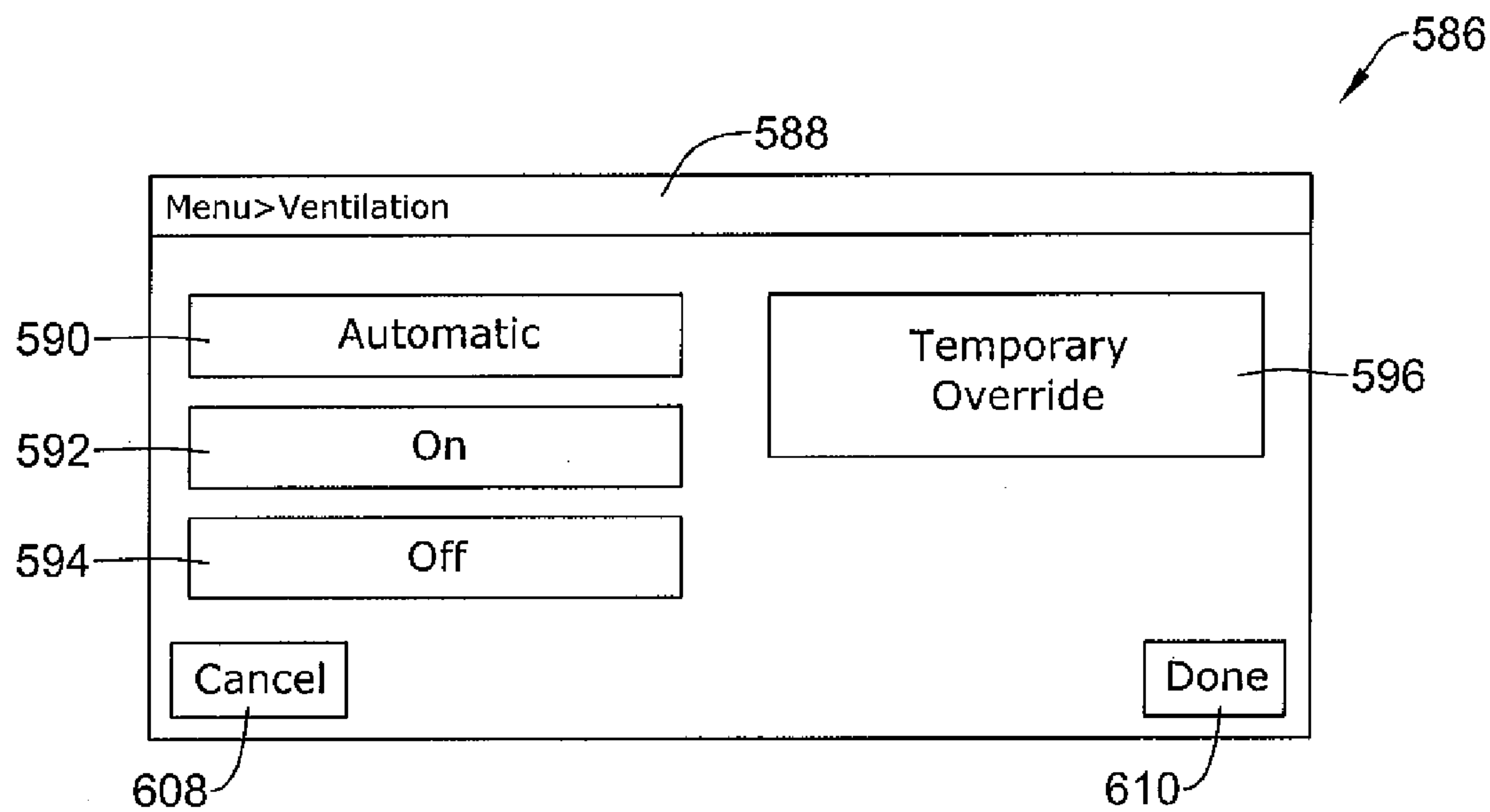


Figure 59

*Figure 60**Figure 61*

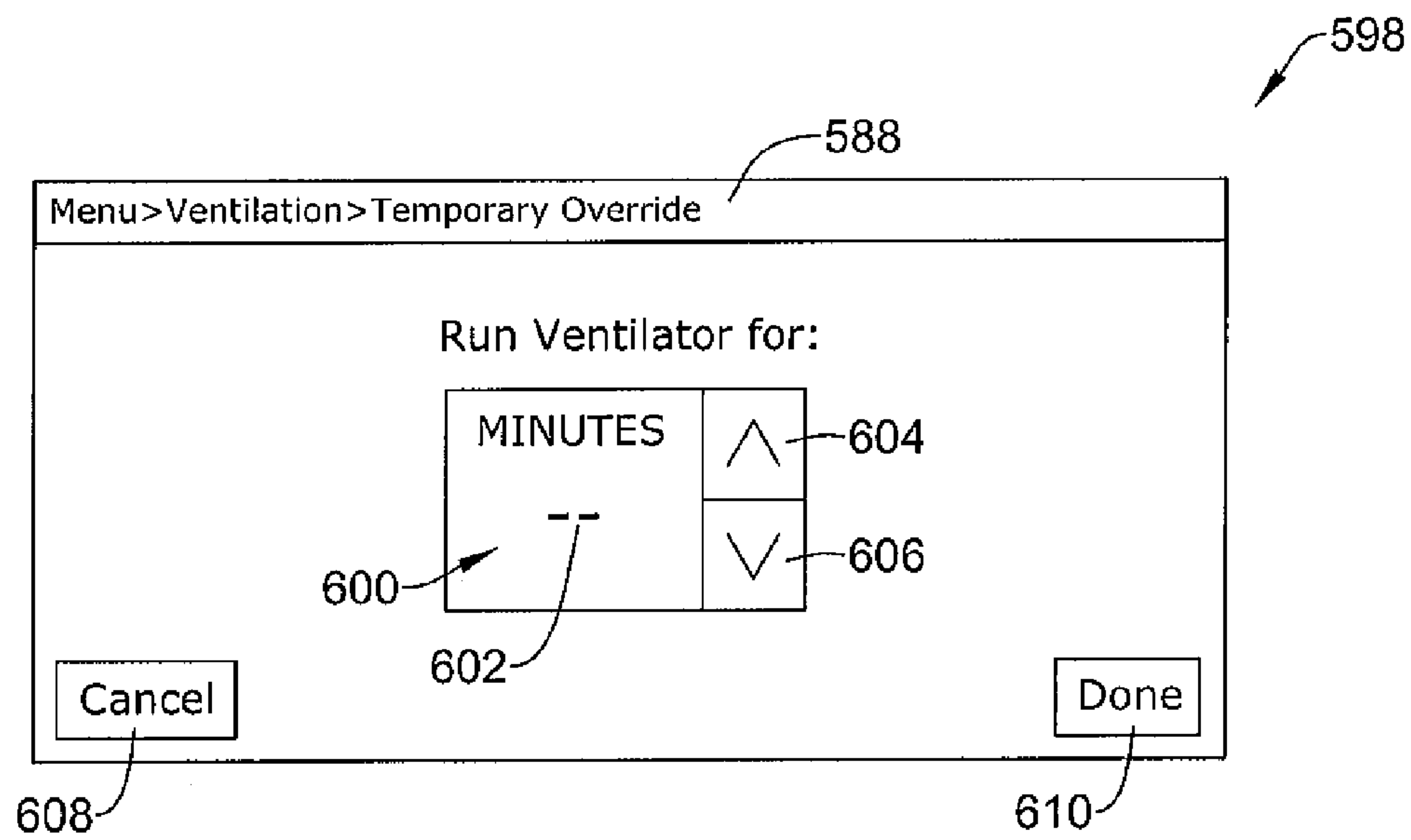


Figure 62

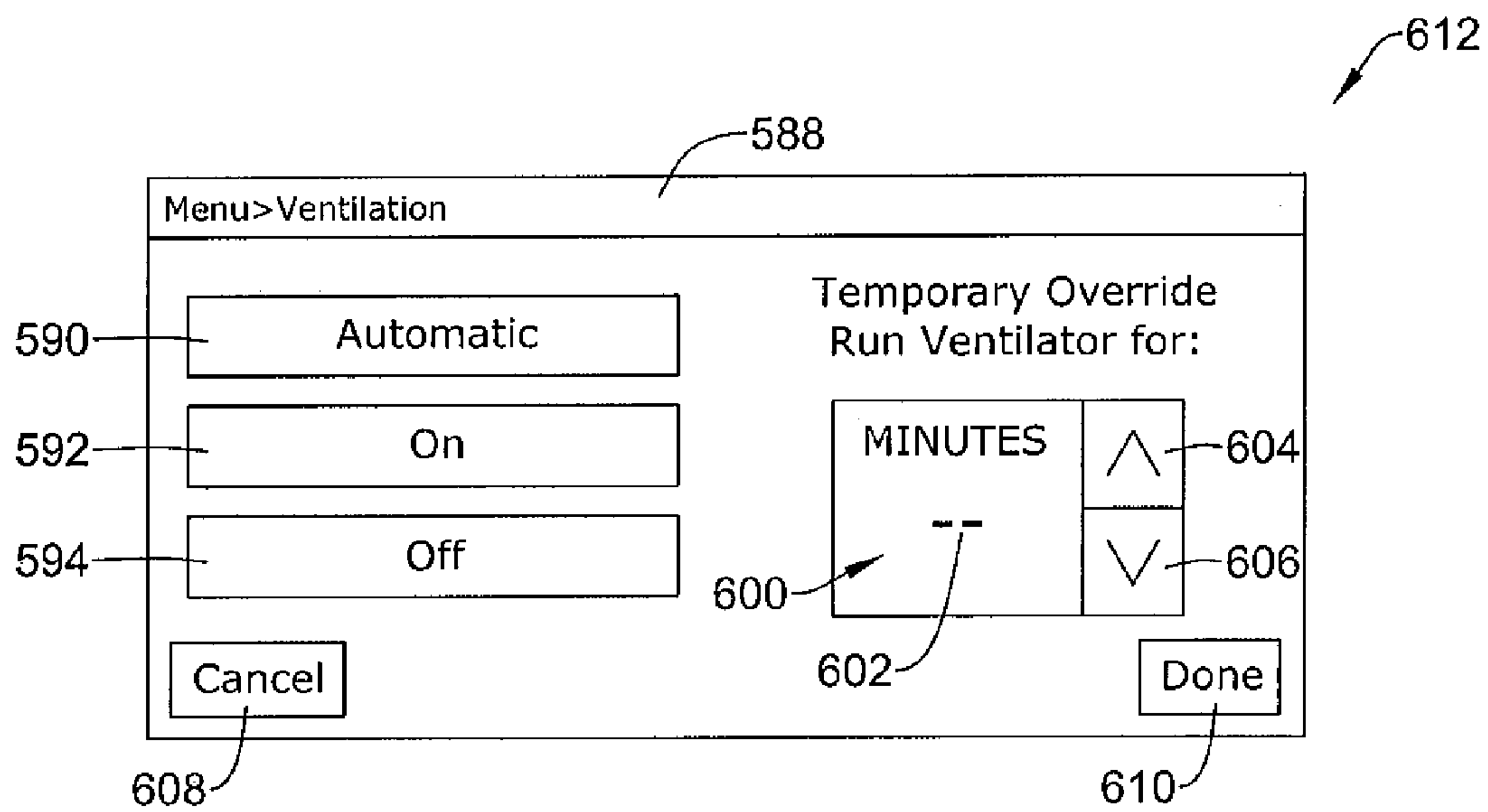
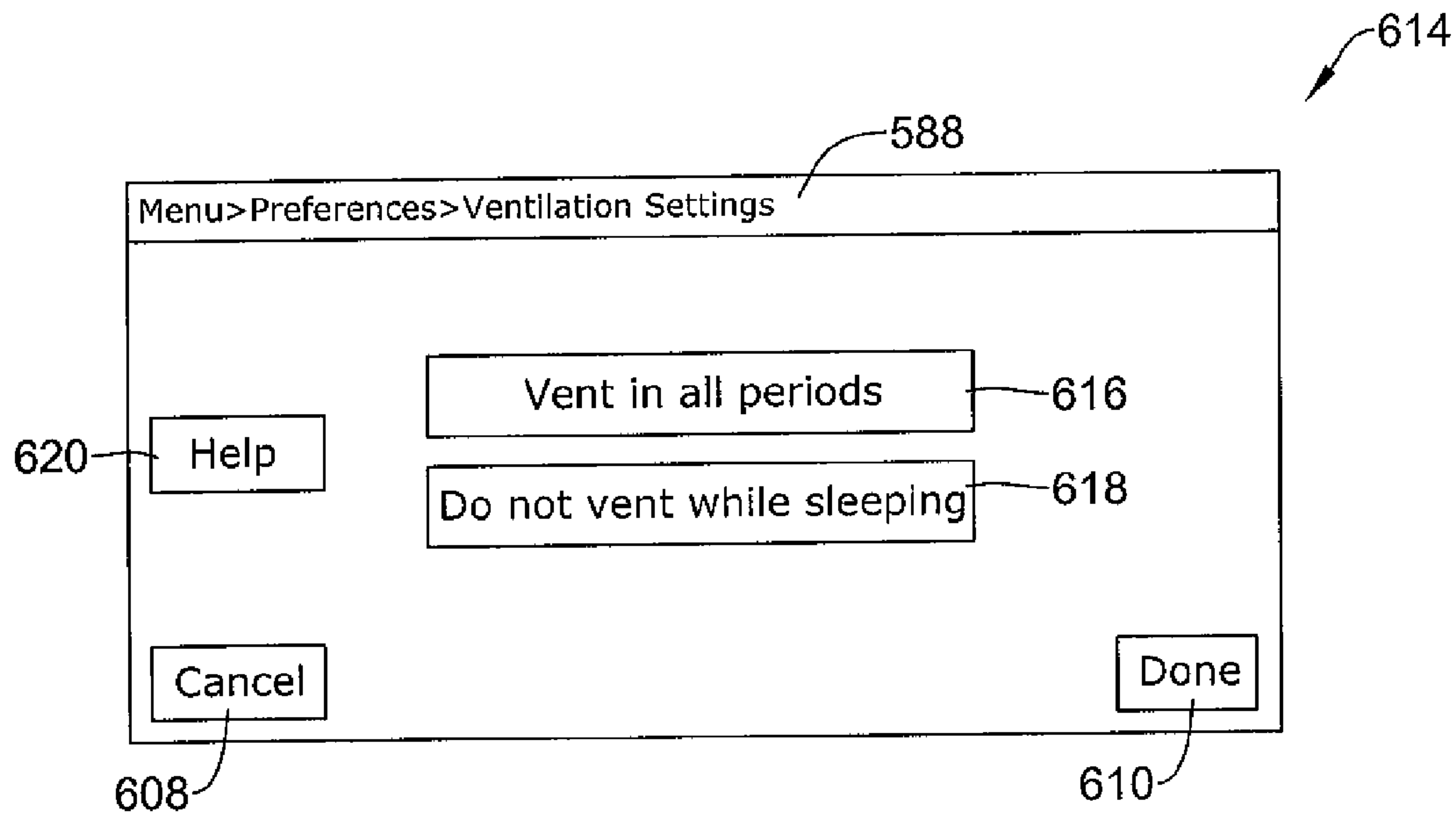
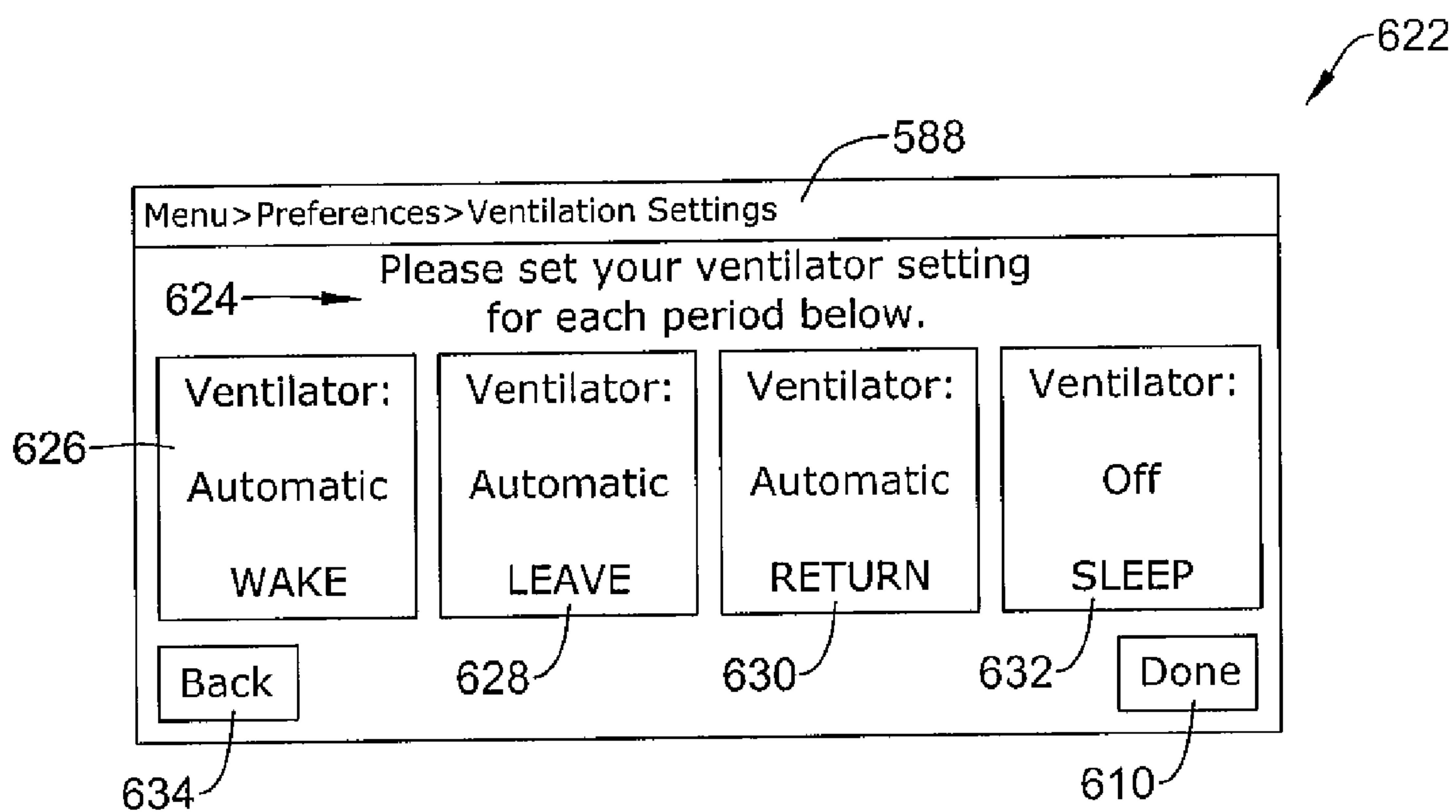


Figure 63

*Figure 64**Figure 65*

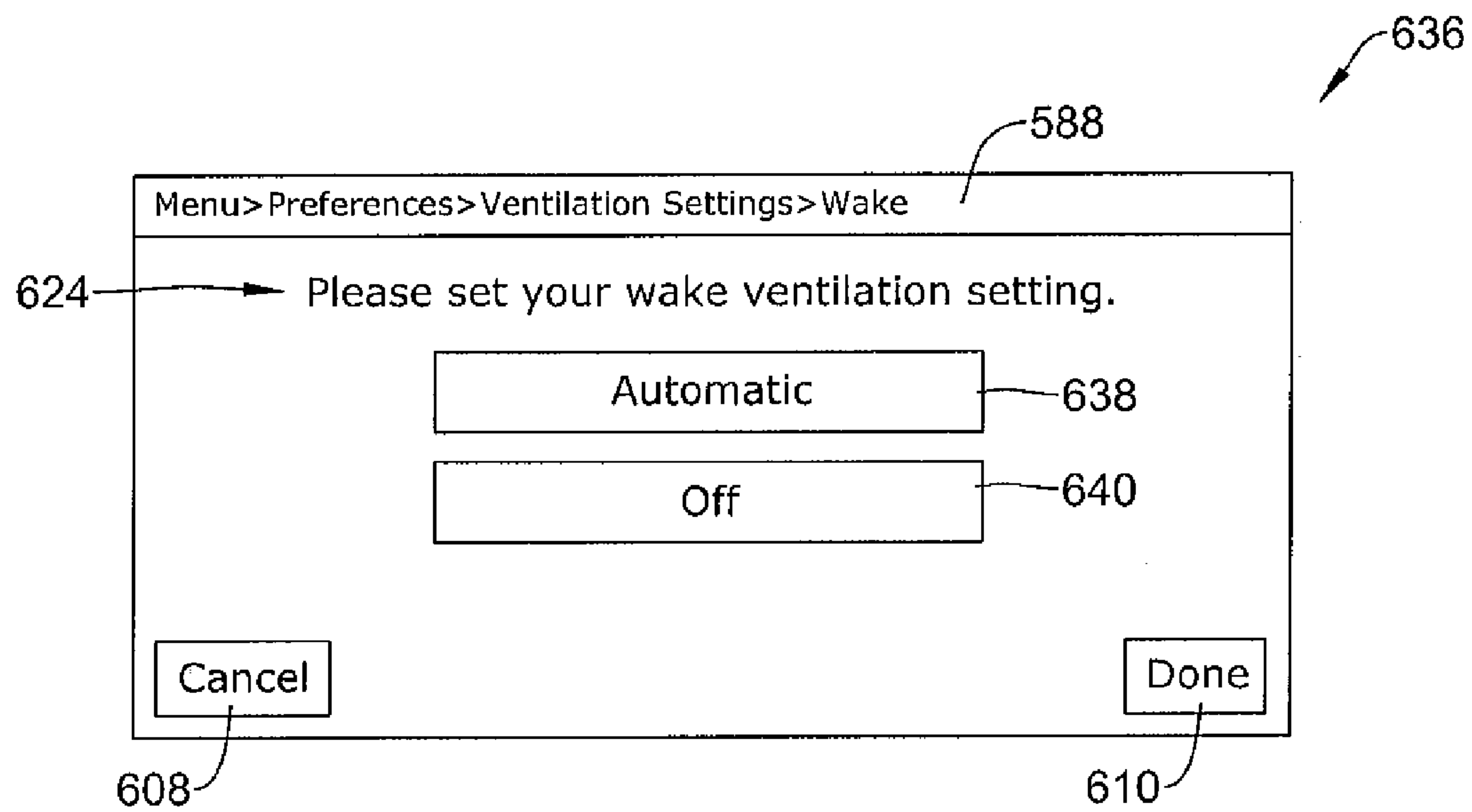


Figure 66

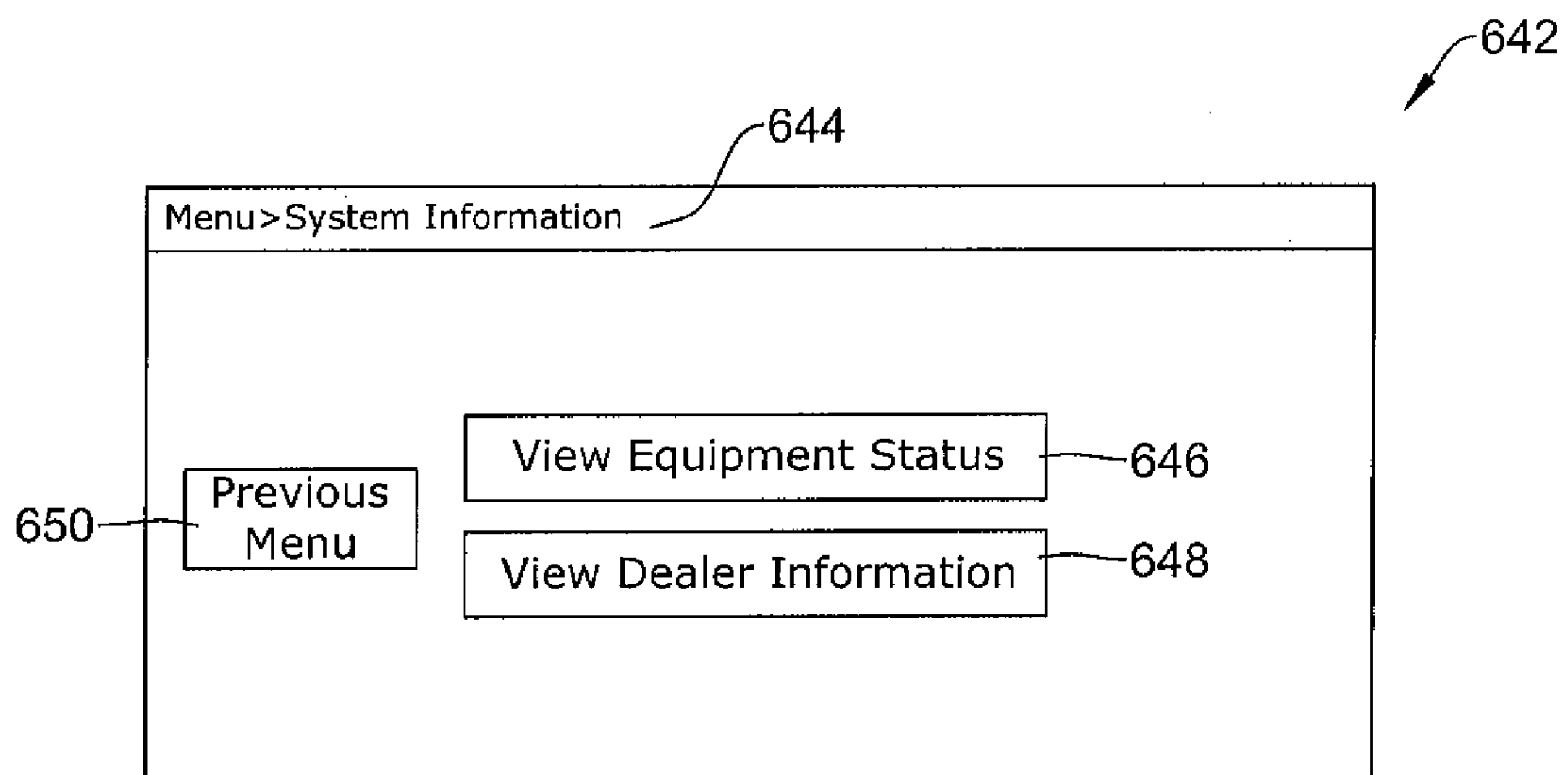
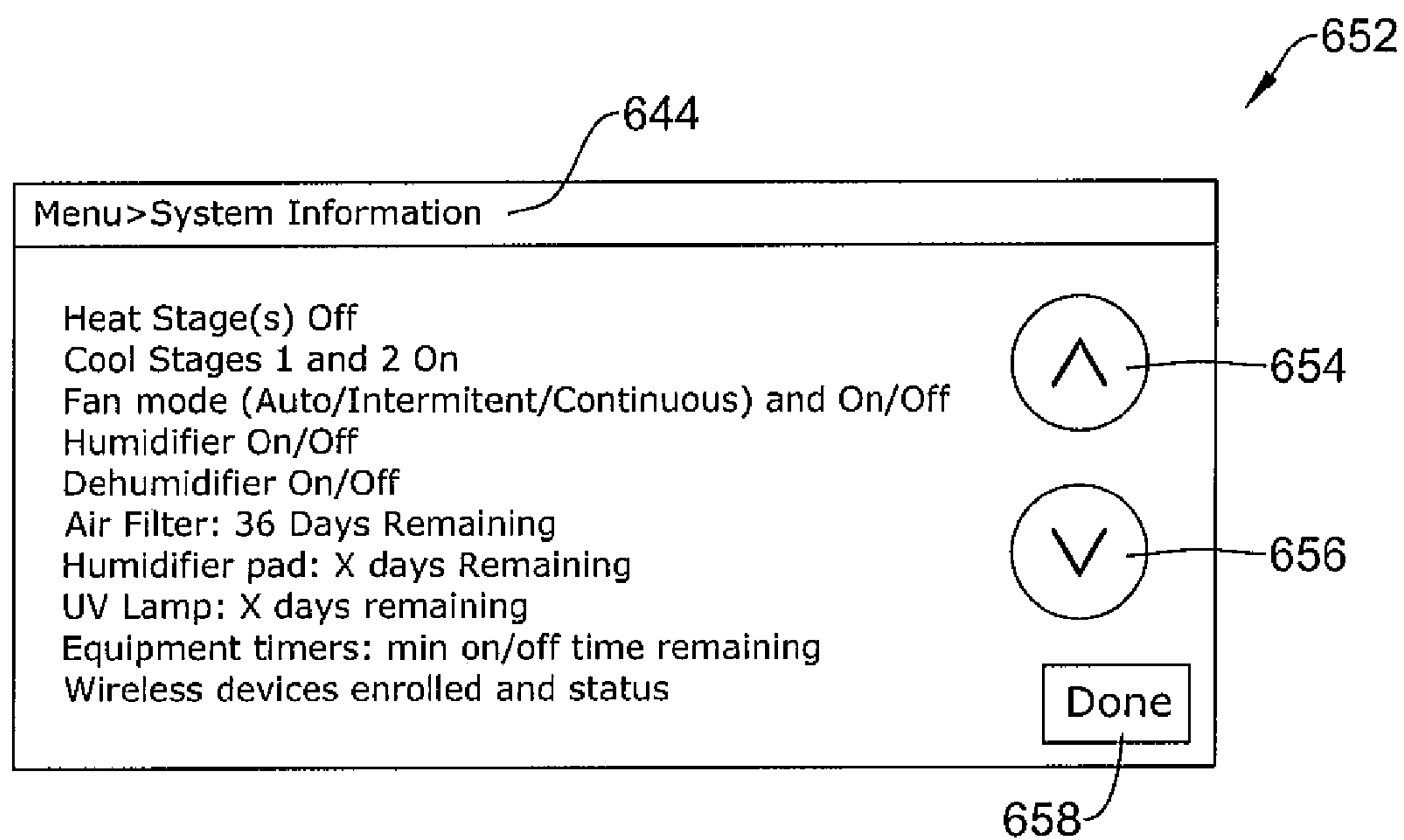
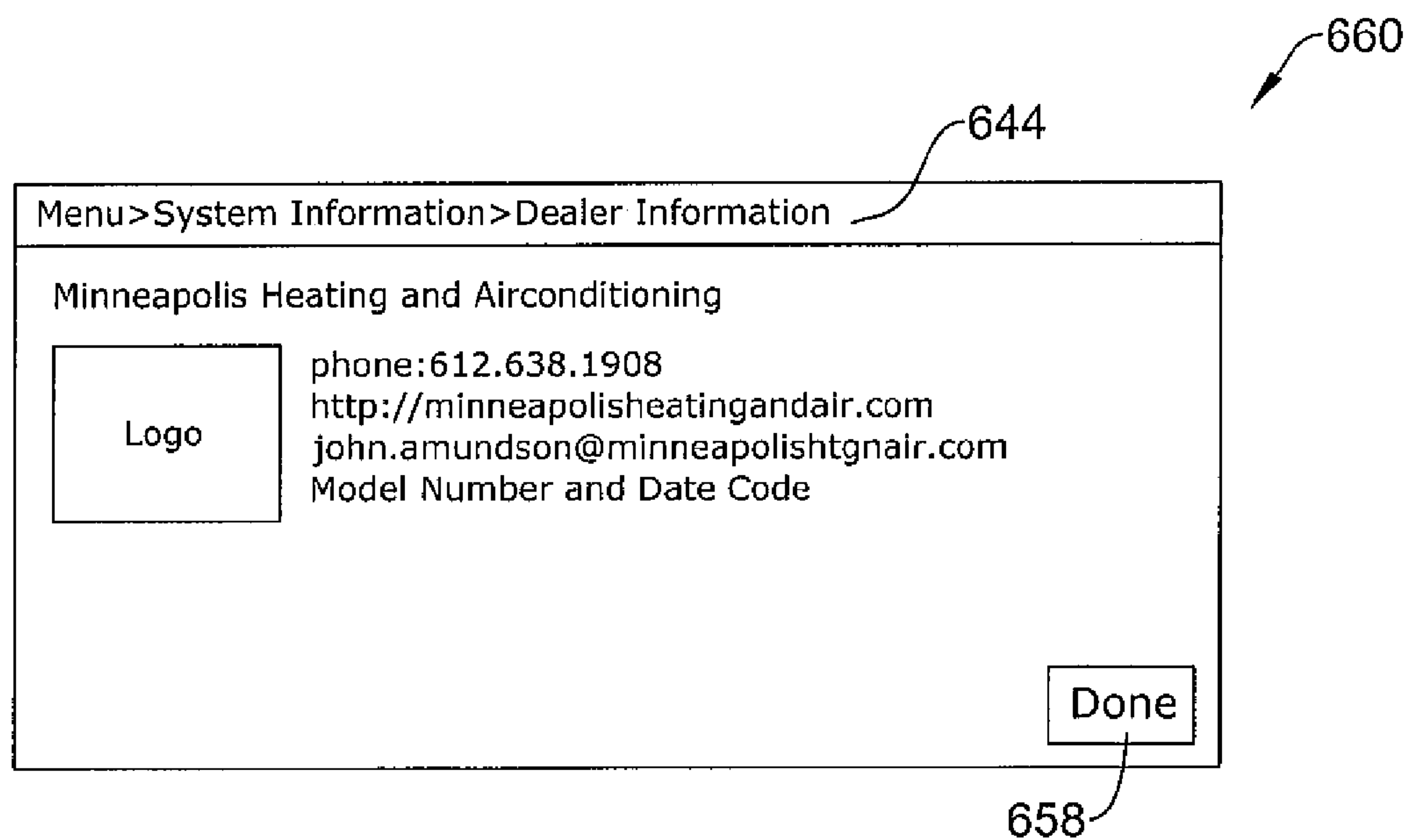


Figure 67

*Figure 68**Figure 69*

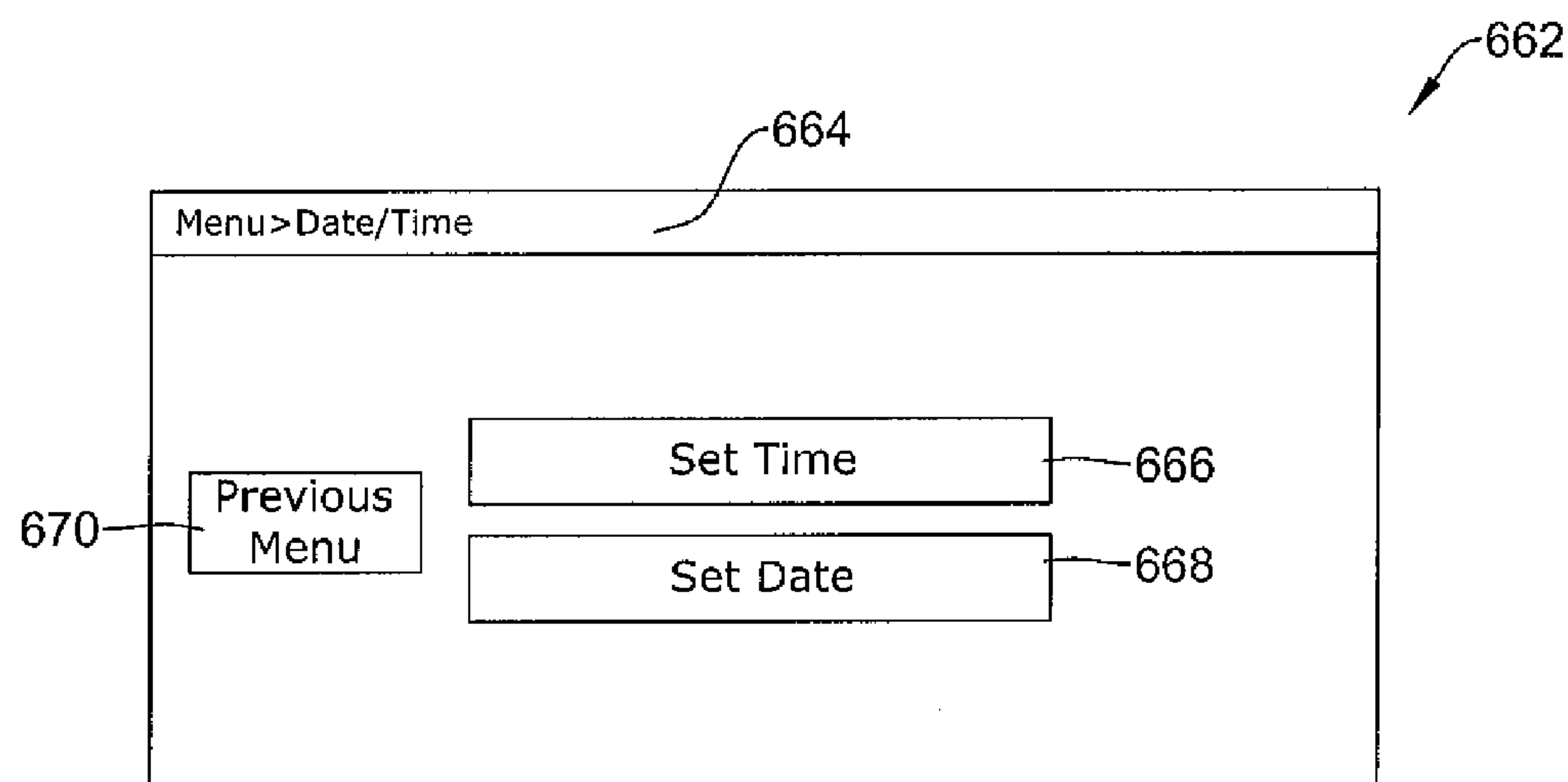


Figure 70

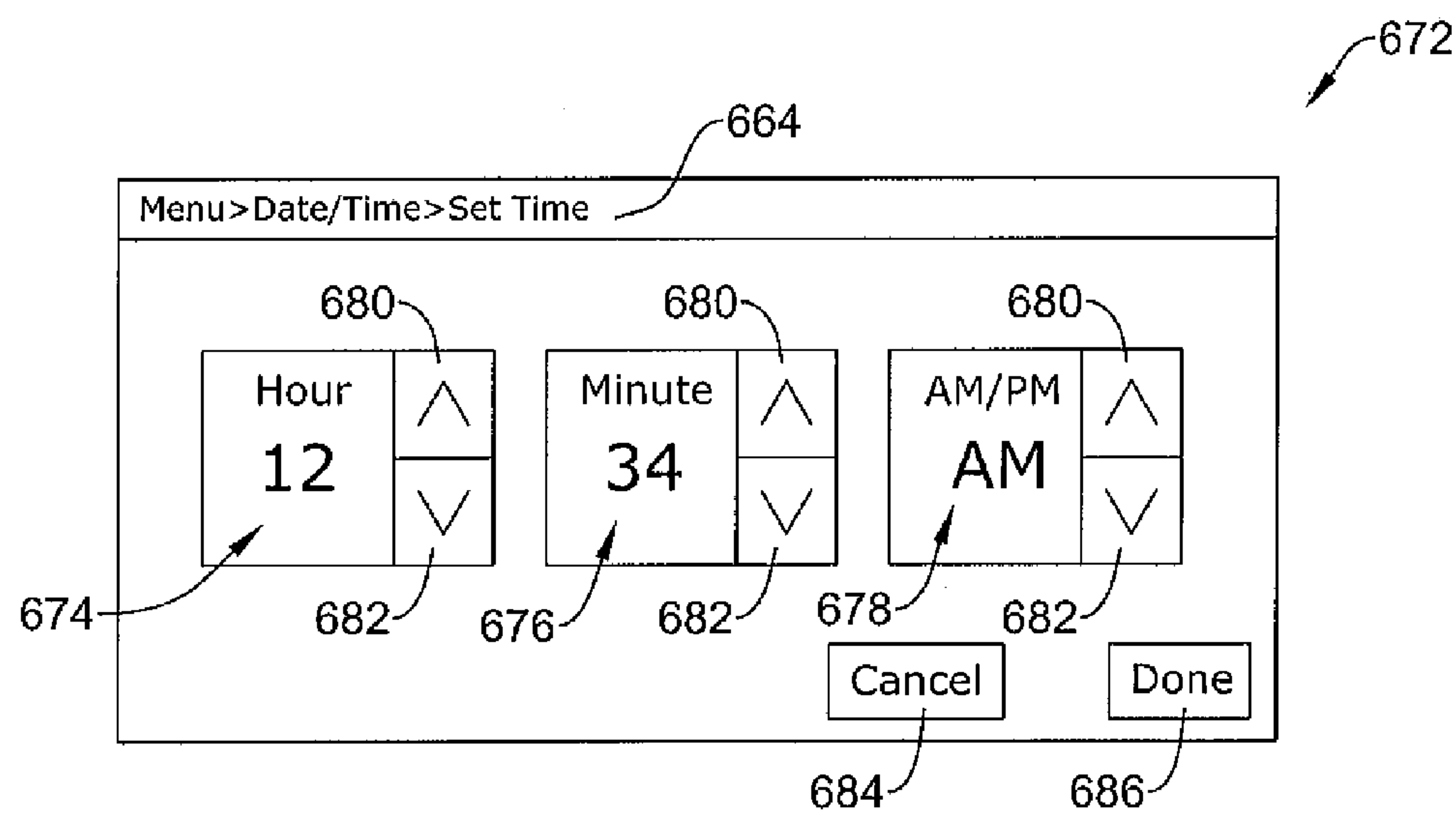


Figure 71

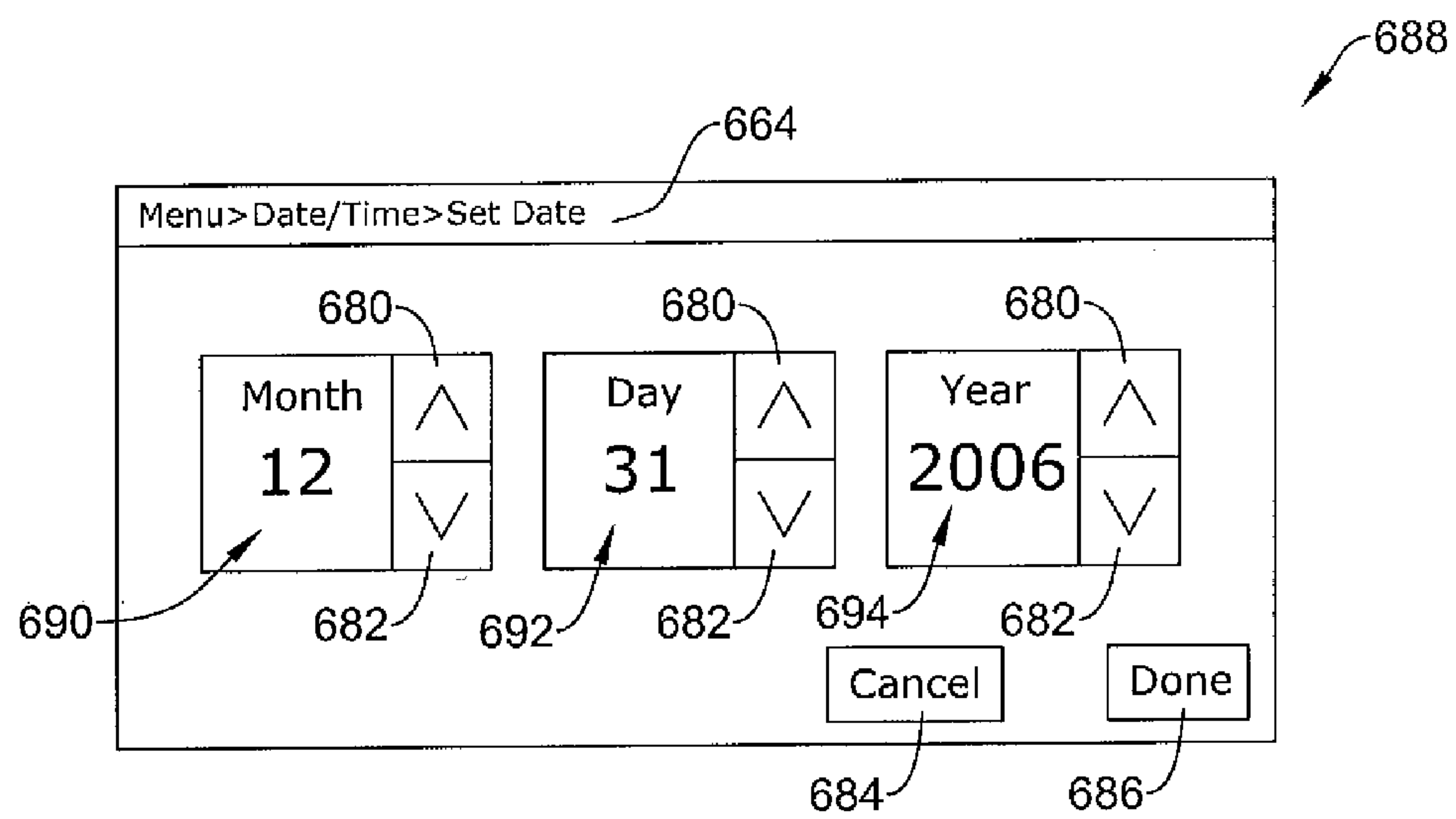
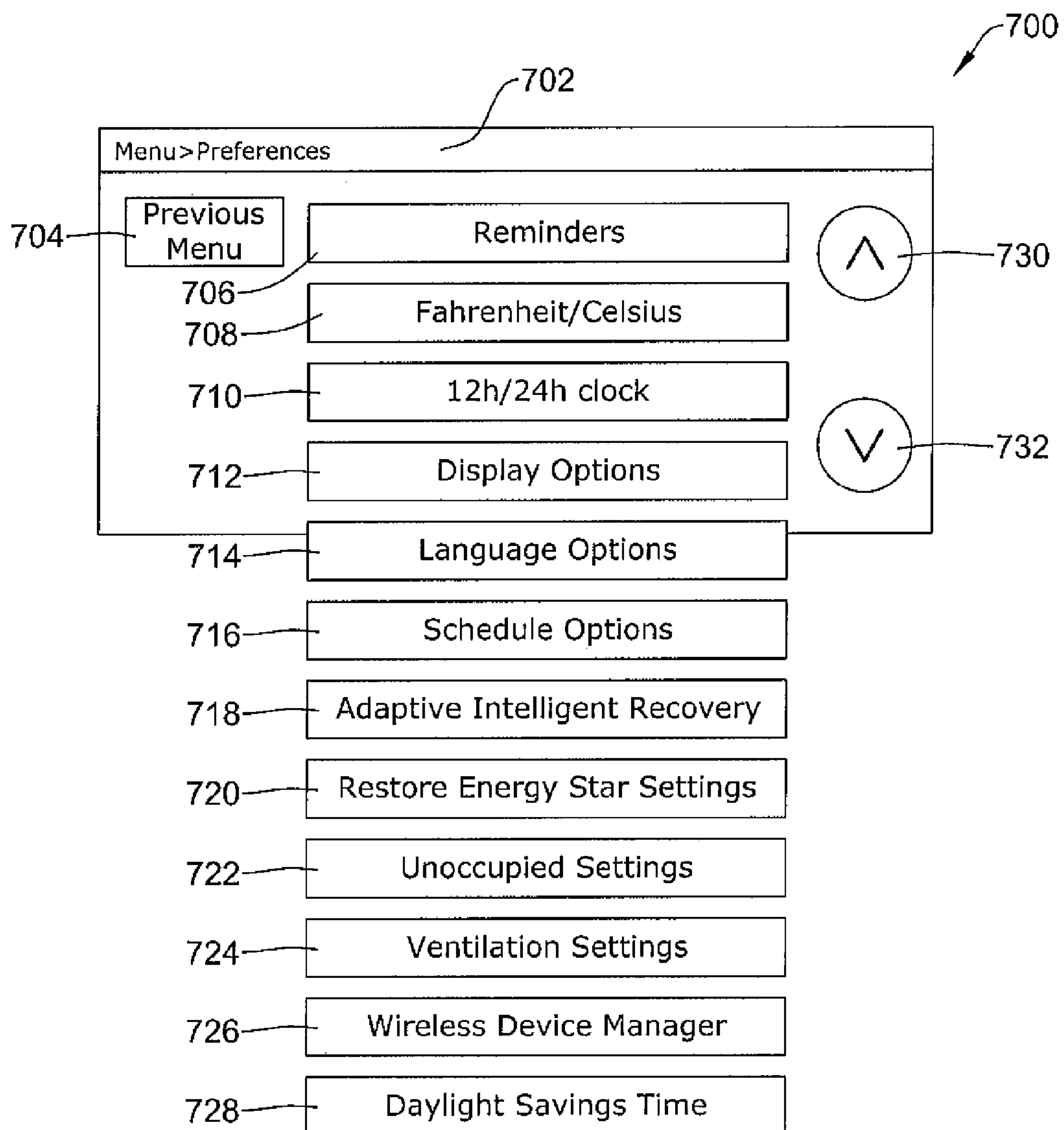
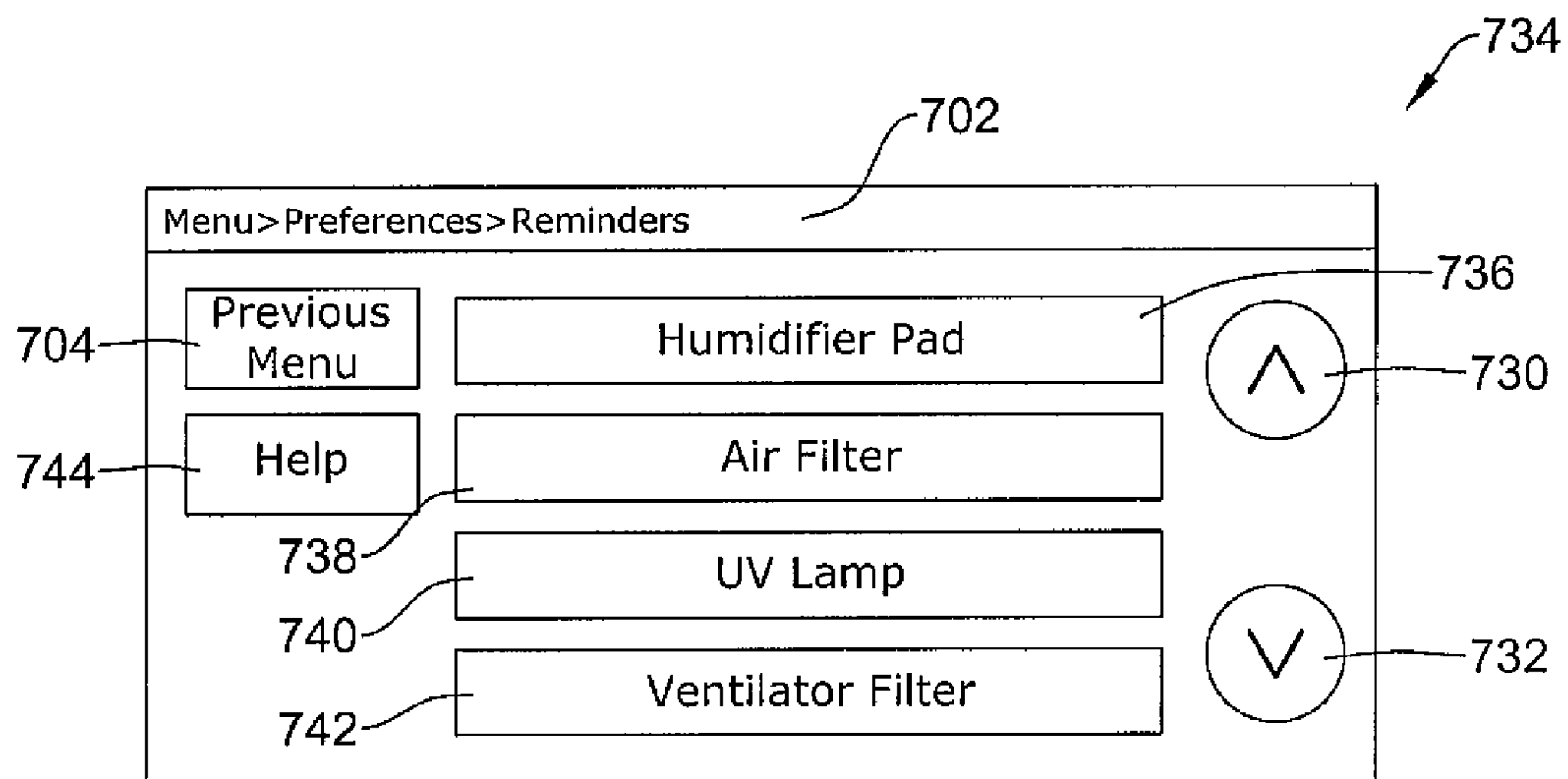
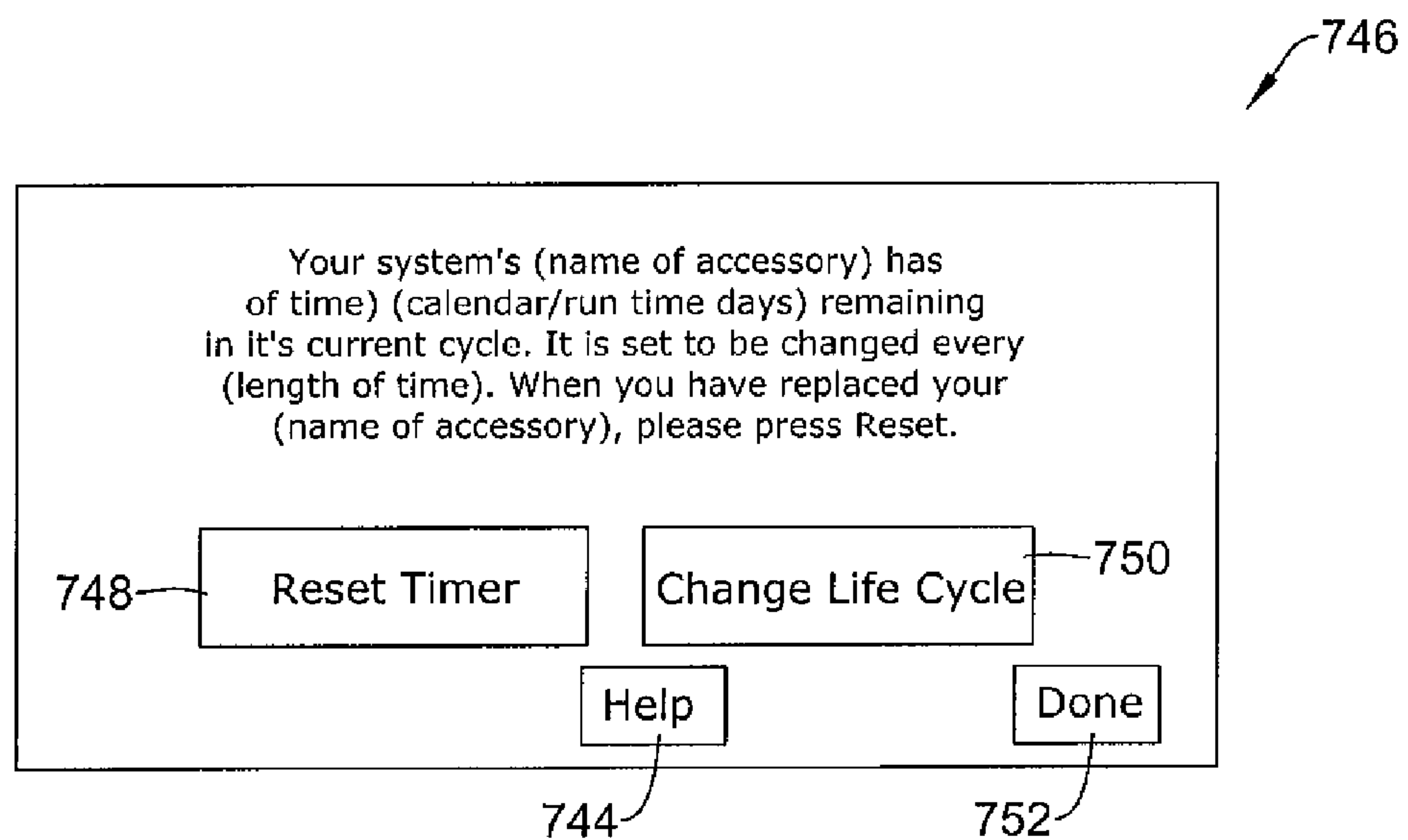
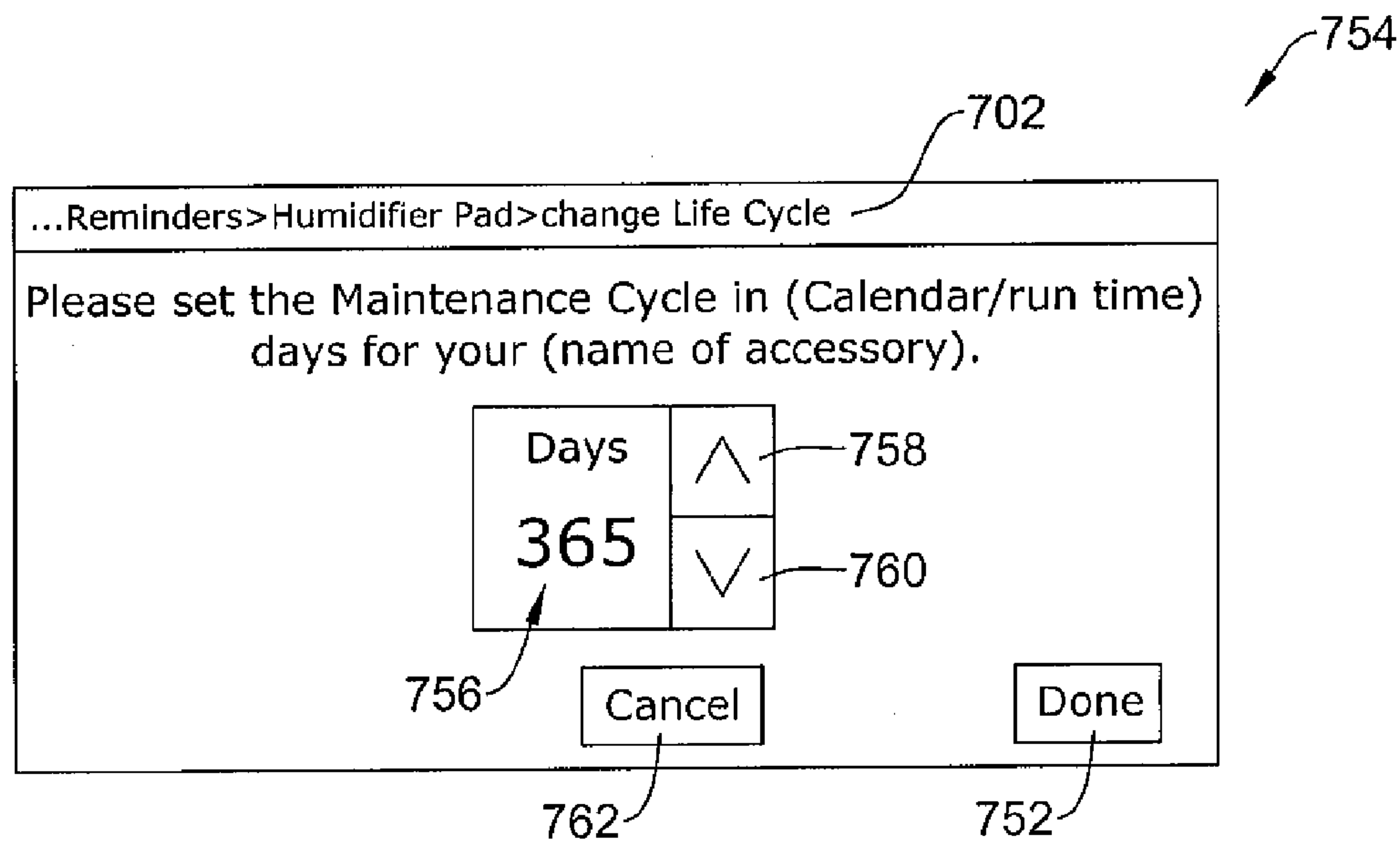
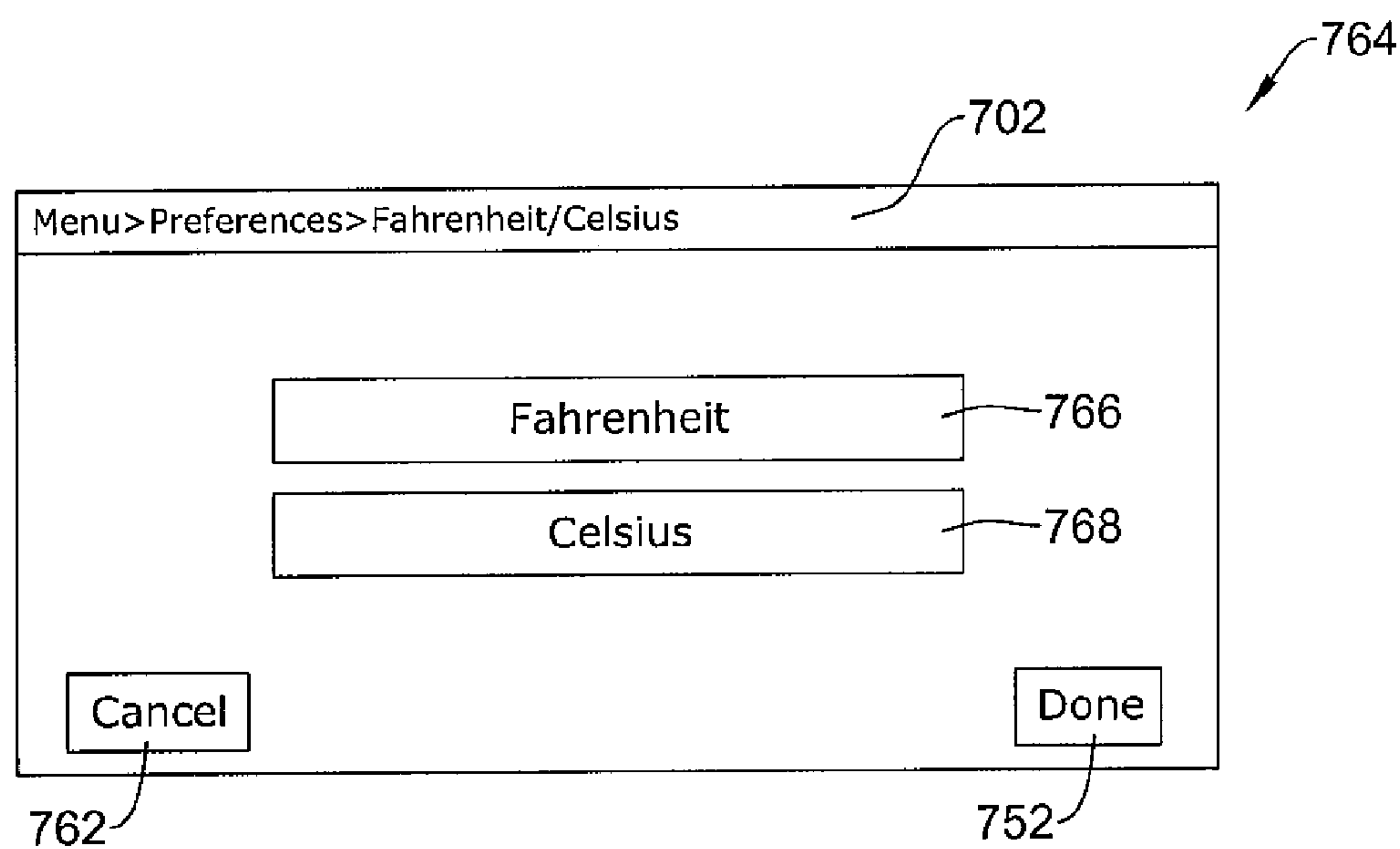


Figure 72

*Figure 73*

*Figure 74**Figure 75*

*Figure 76**Figure 77*

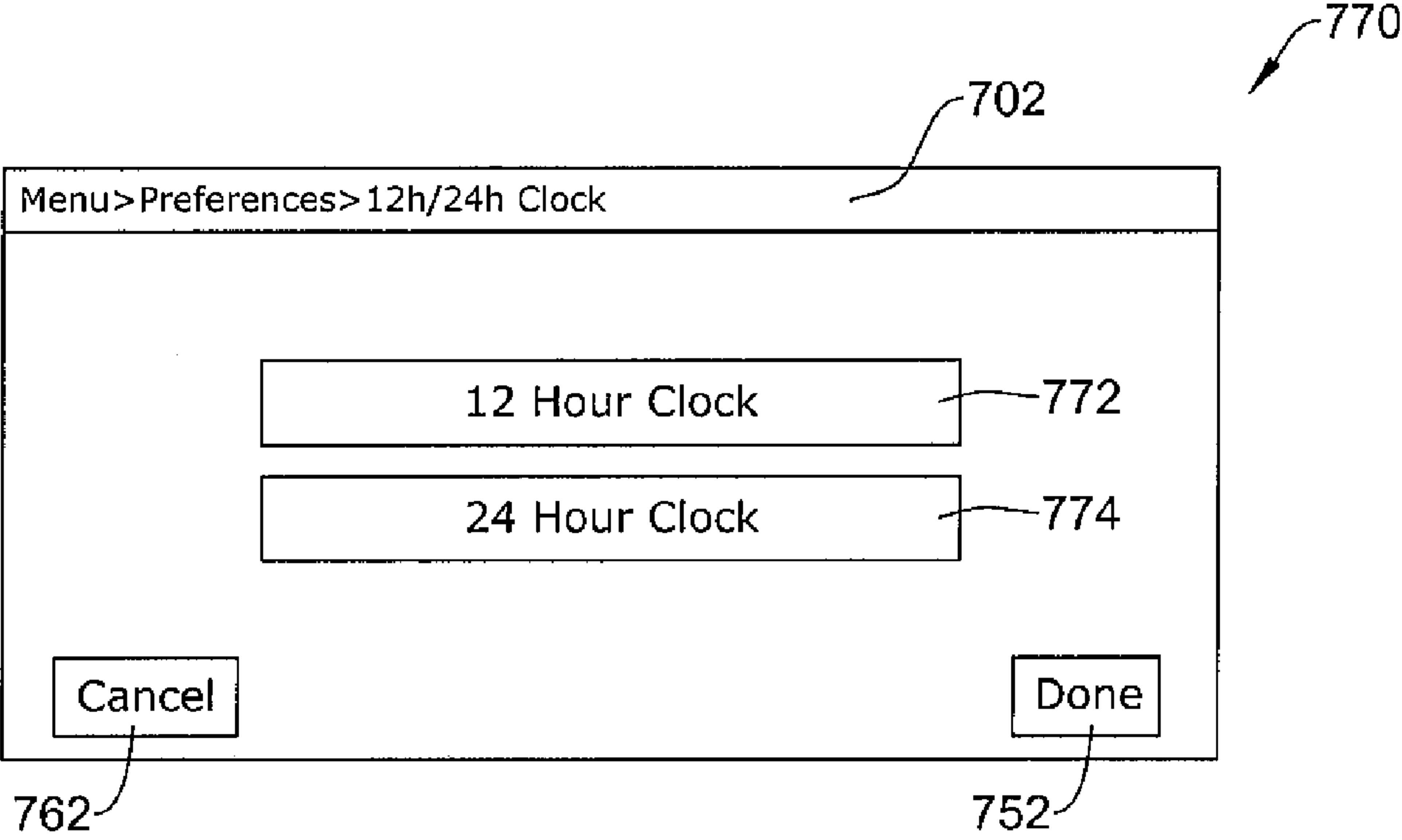


Figure 78

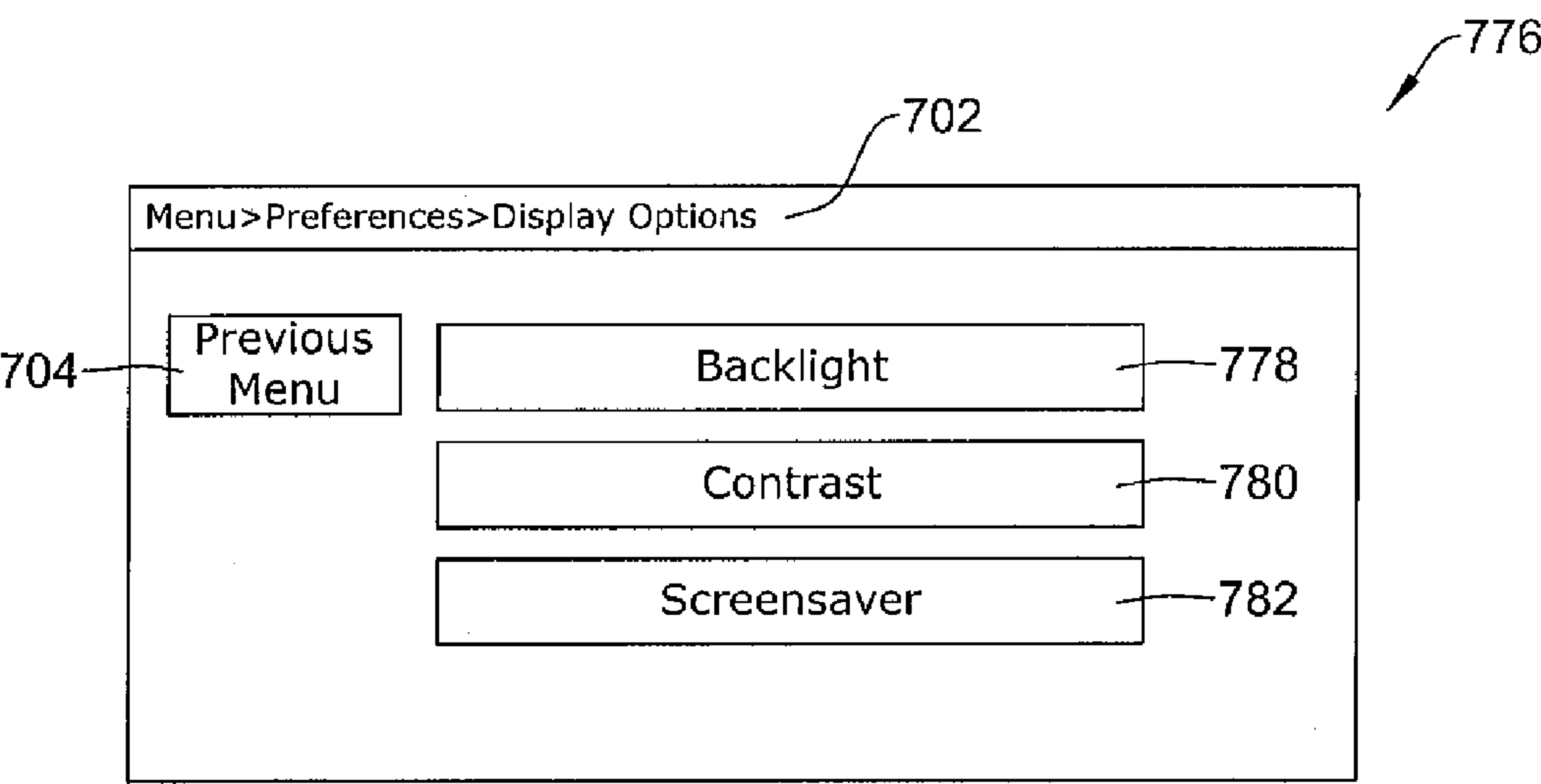
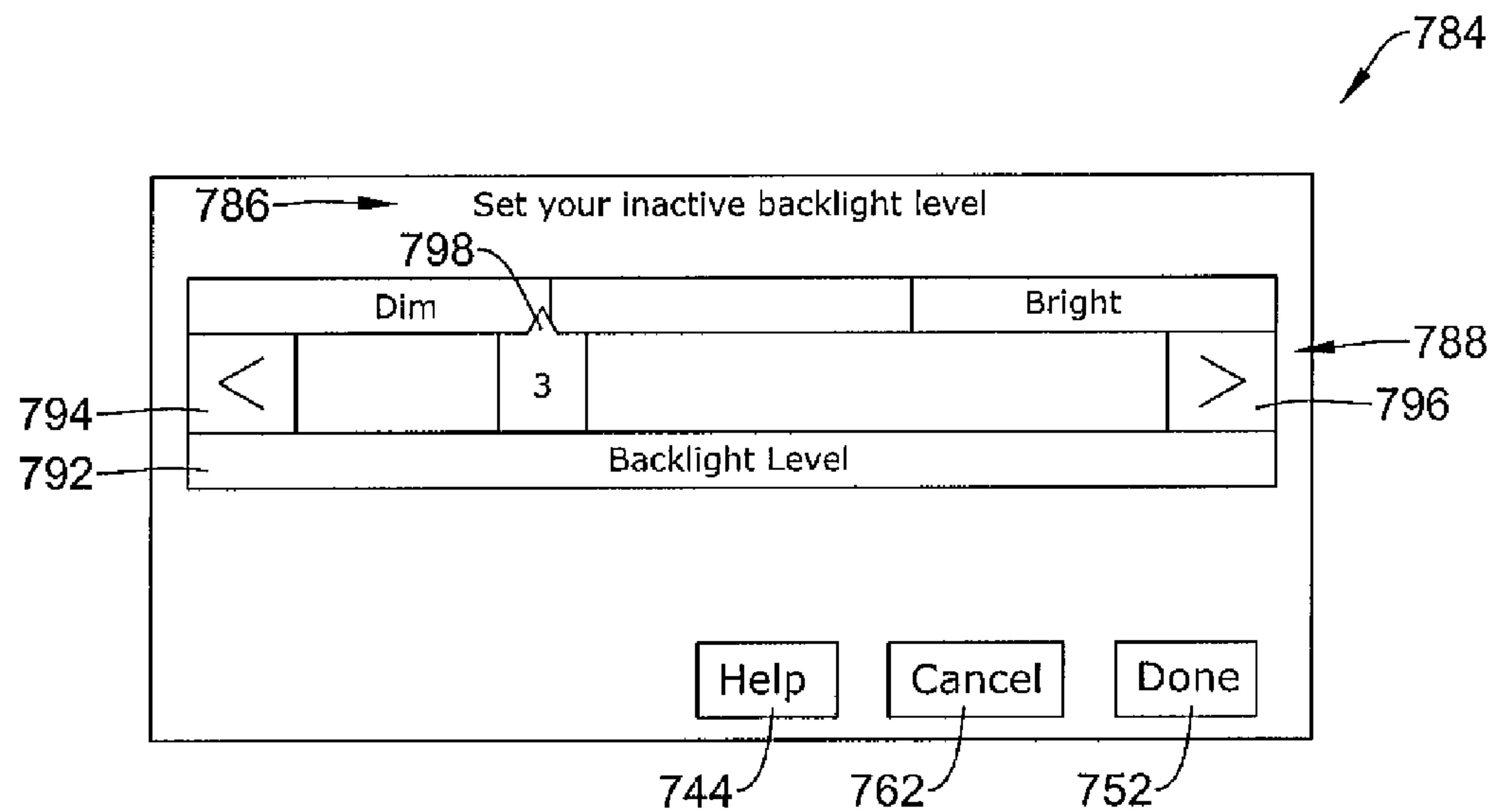
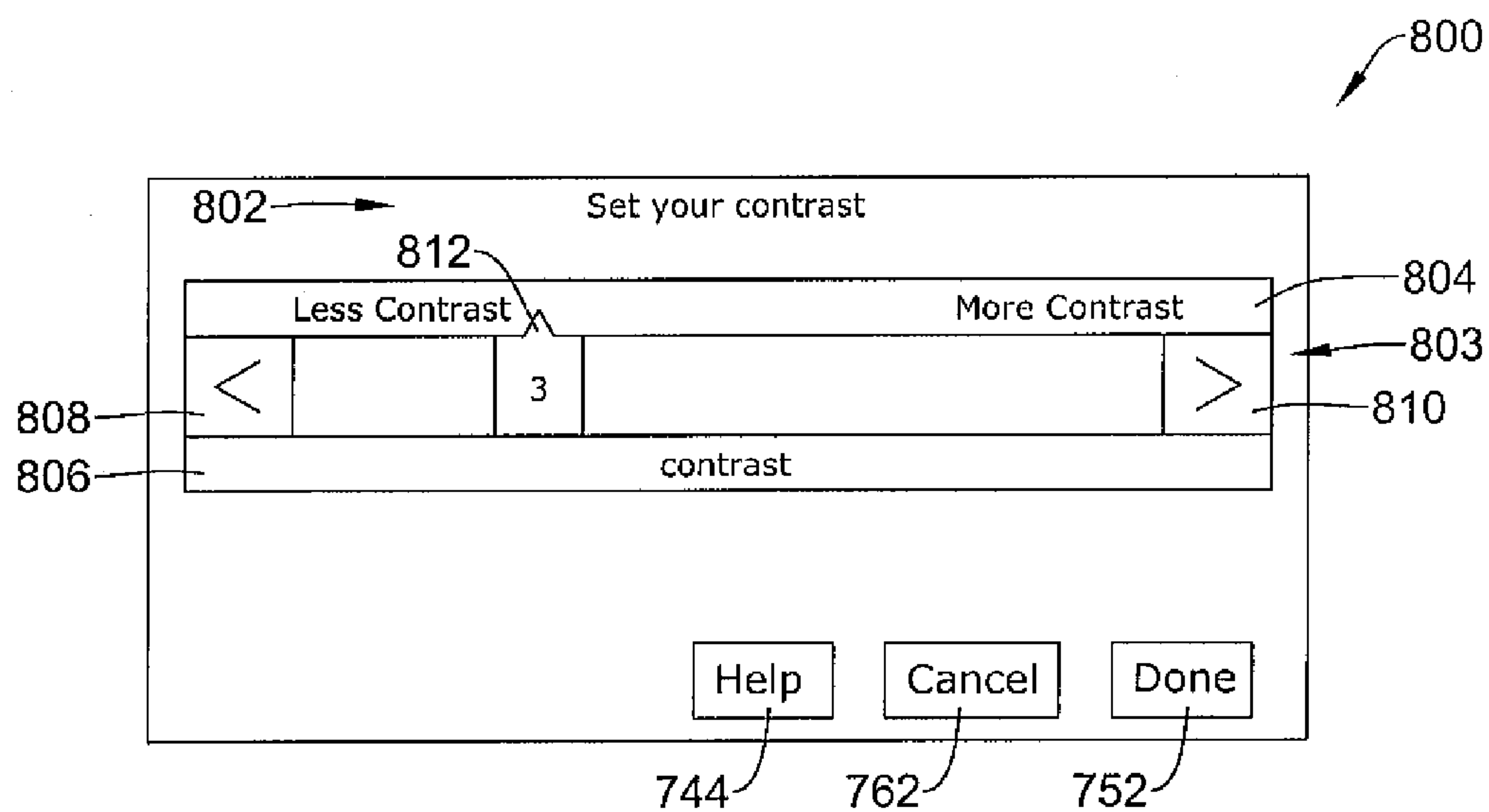
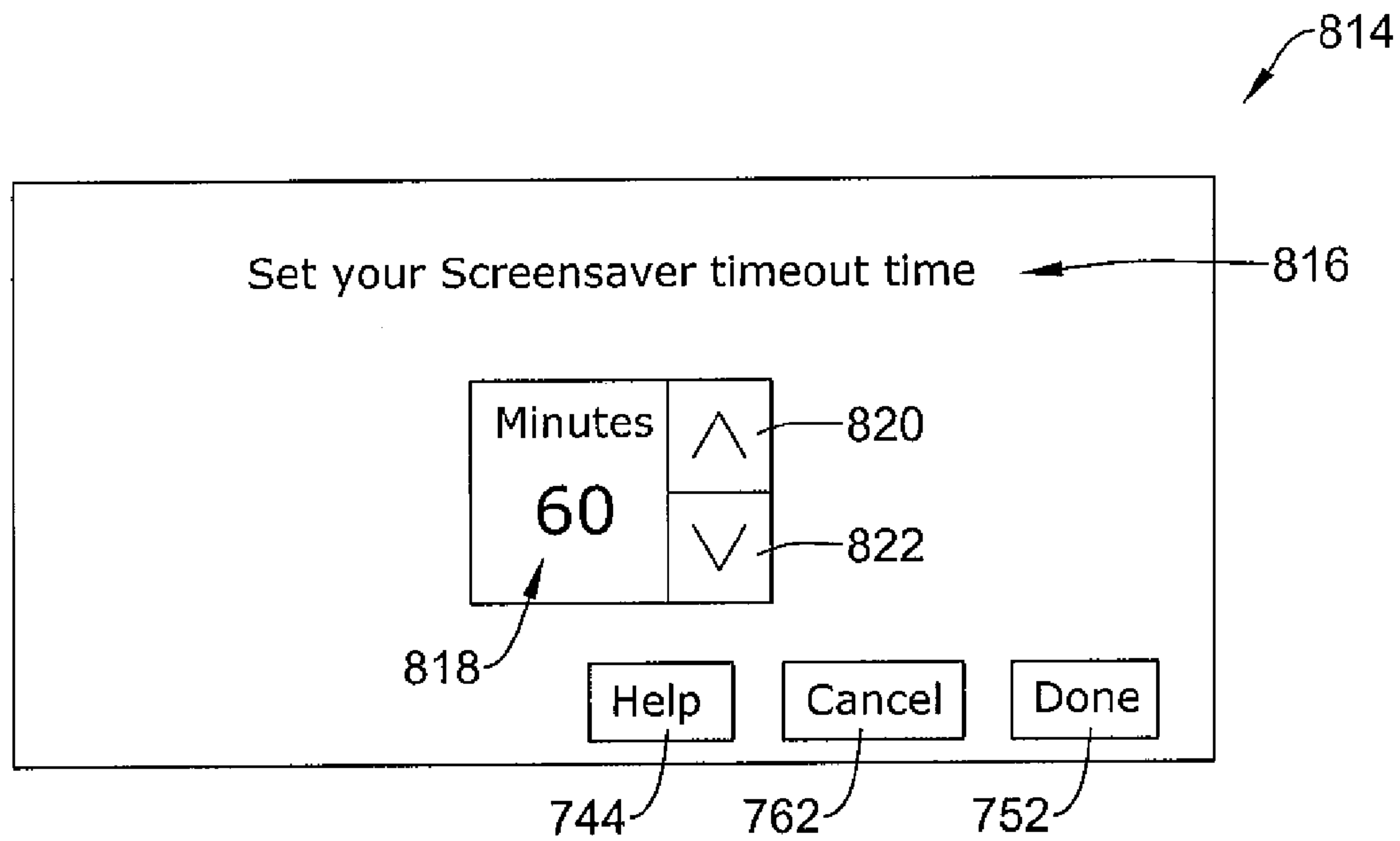
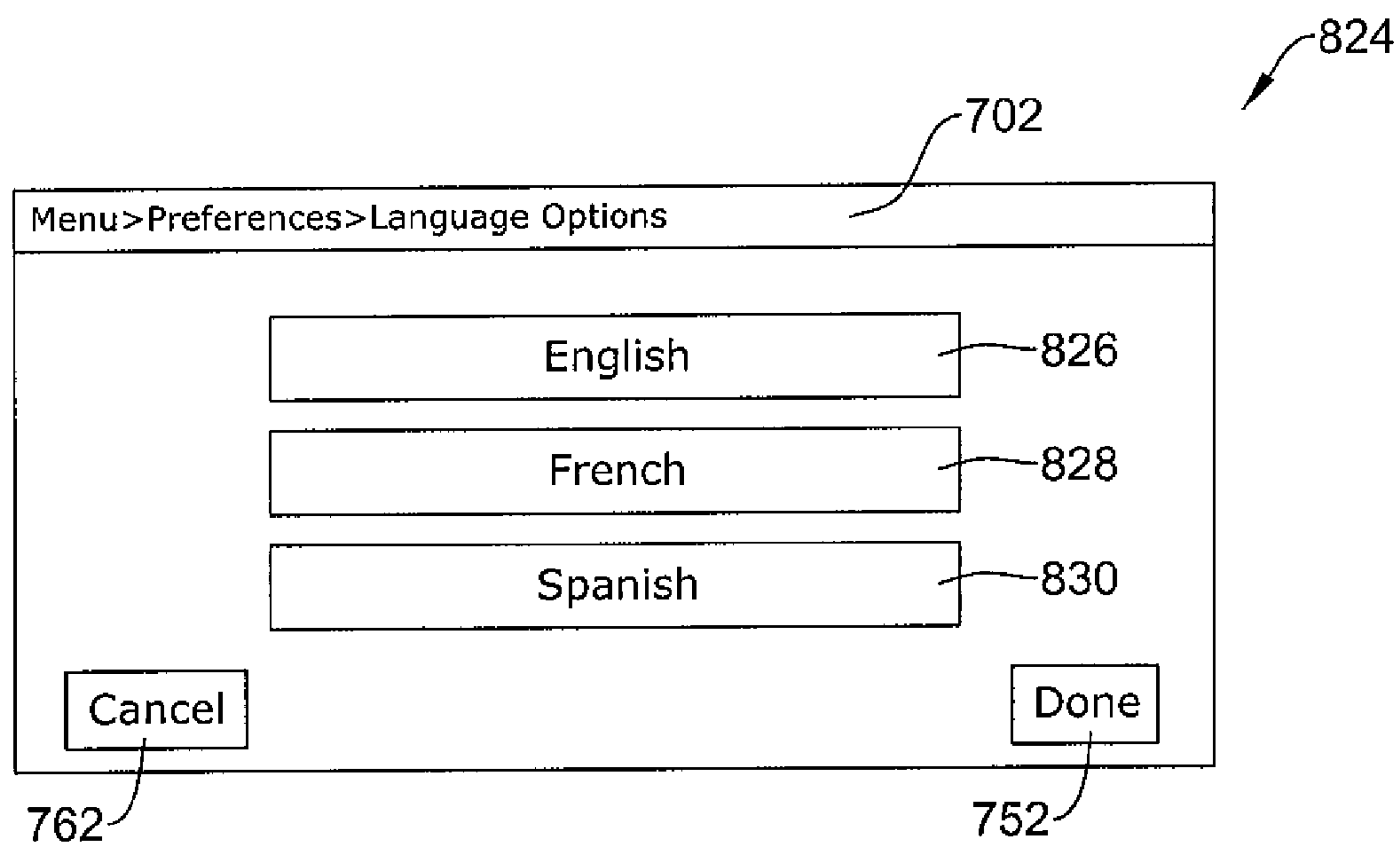
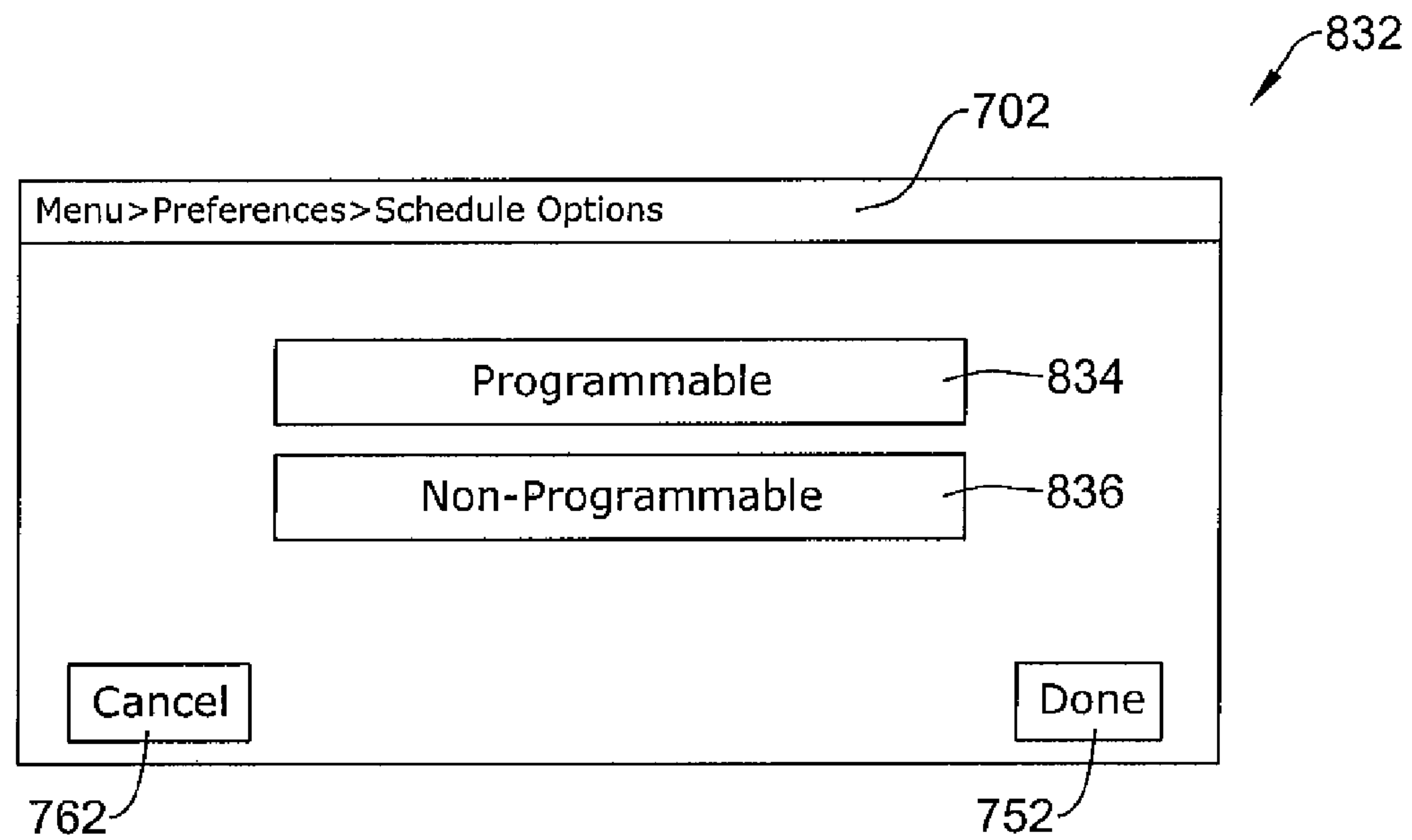
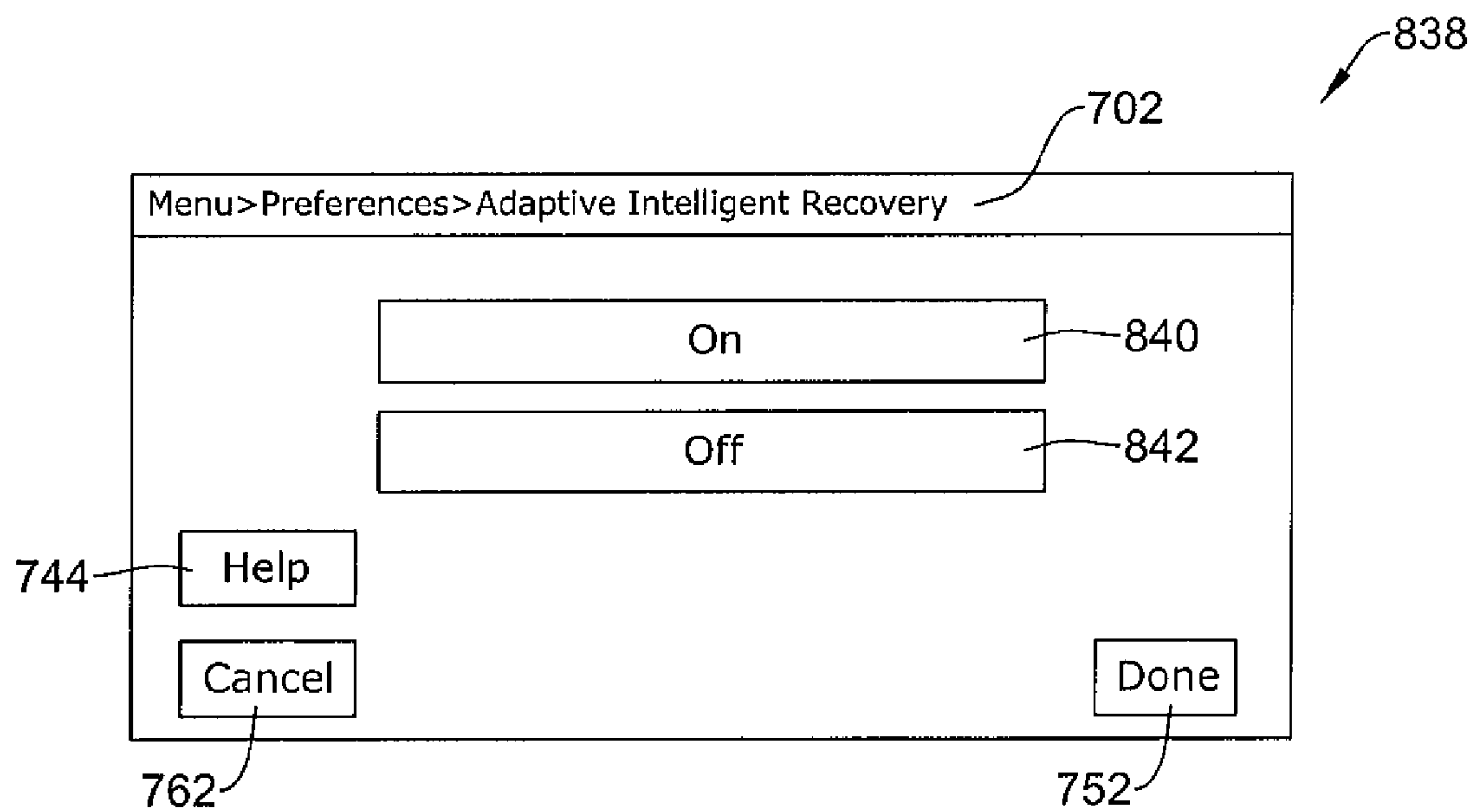
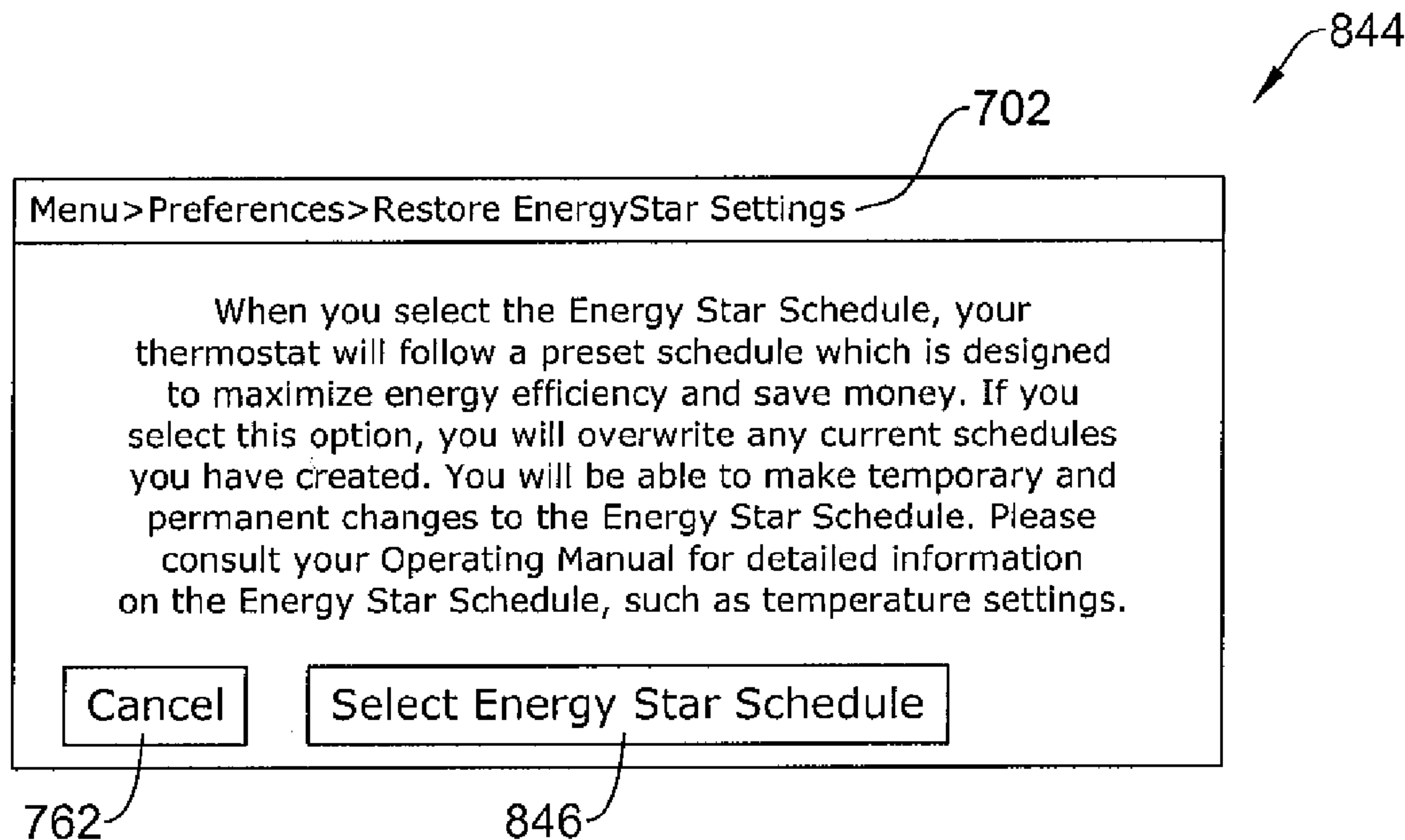
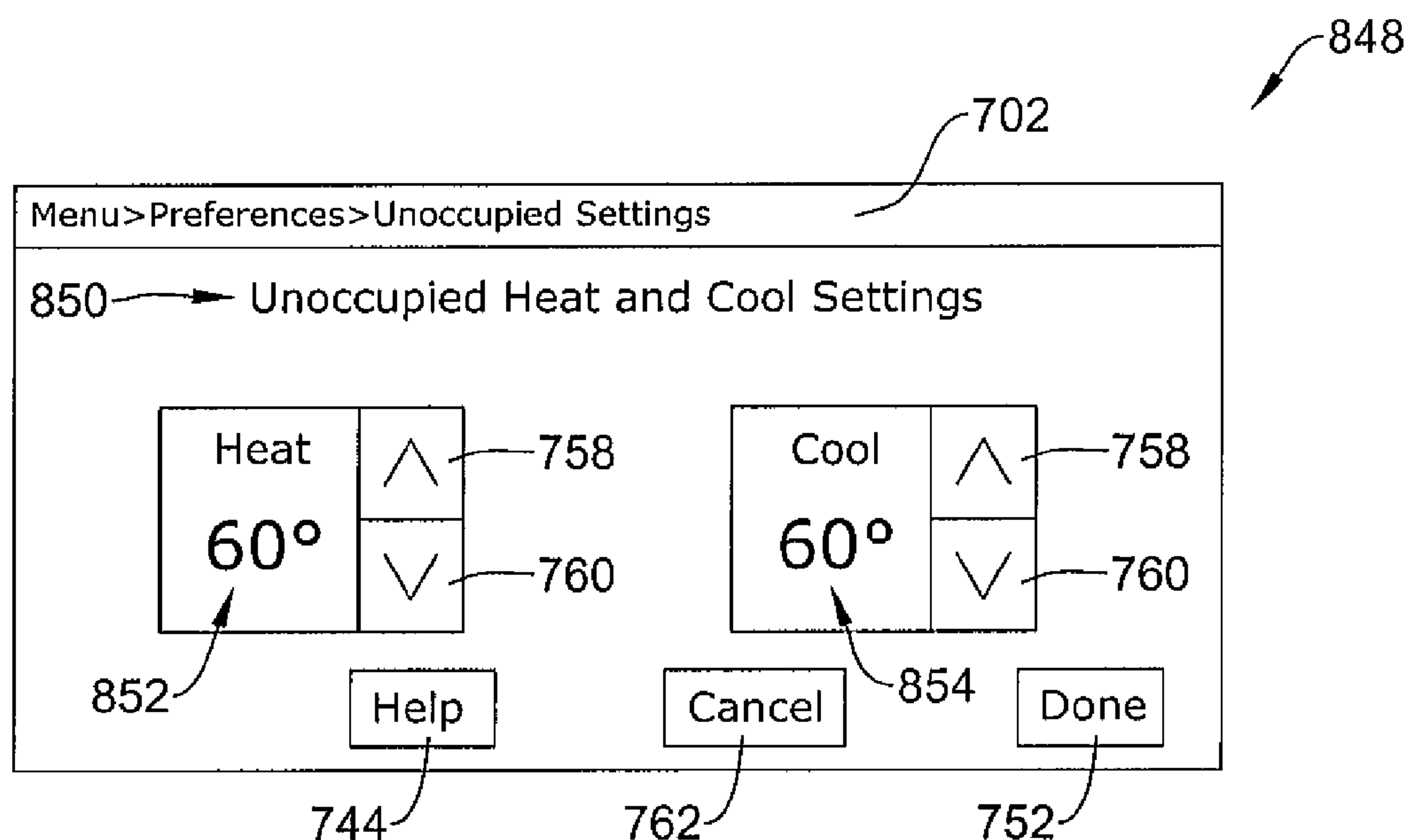


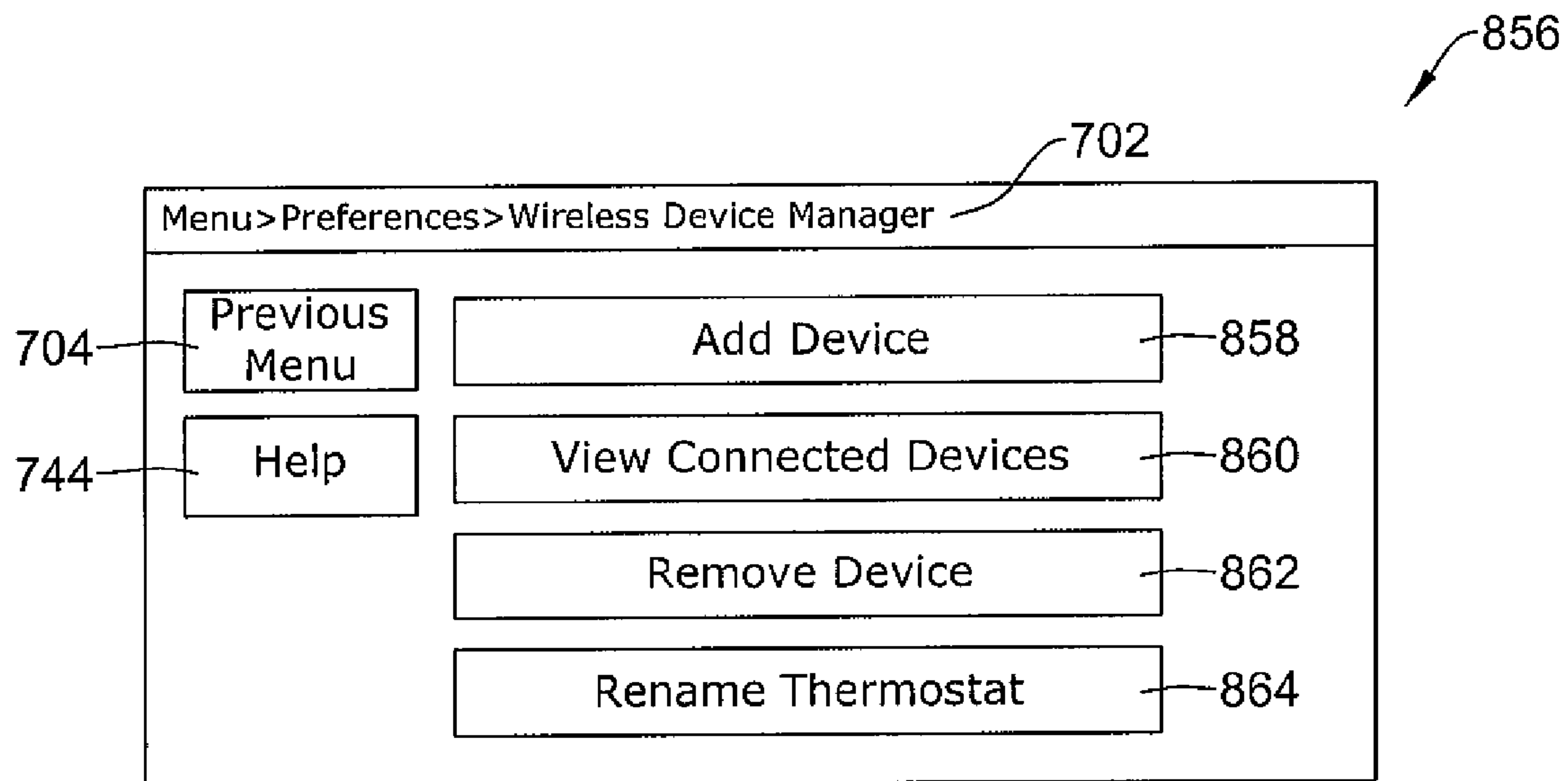
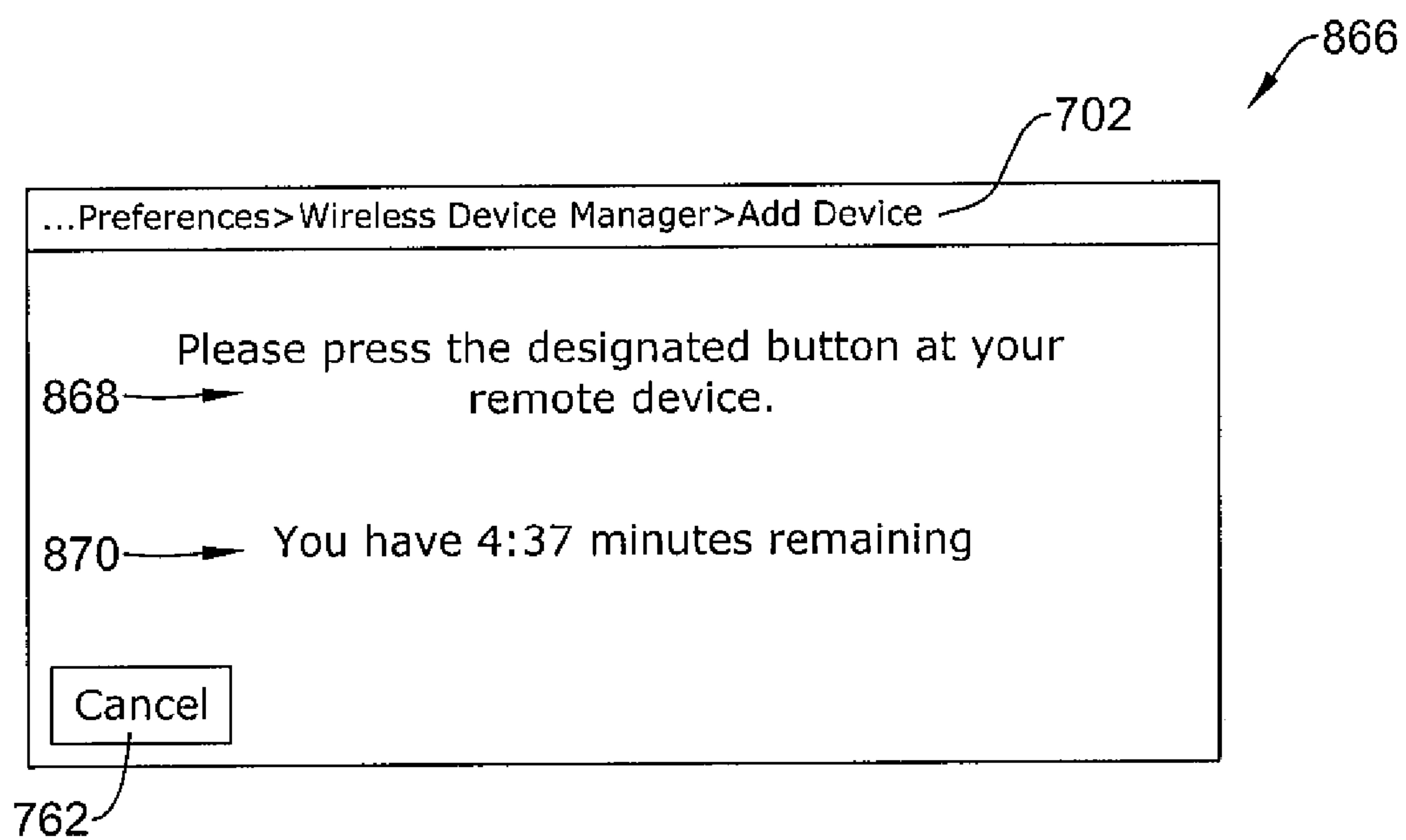
Figure 79

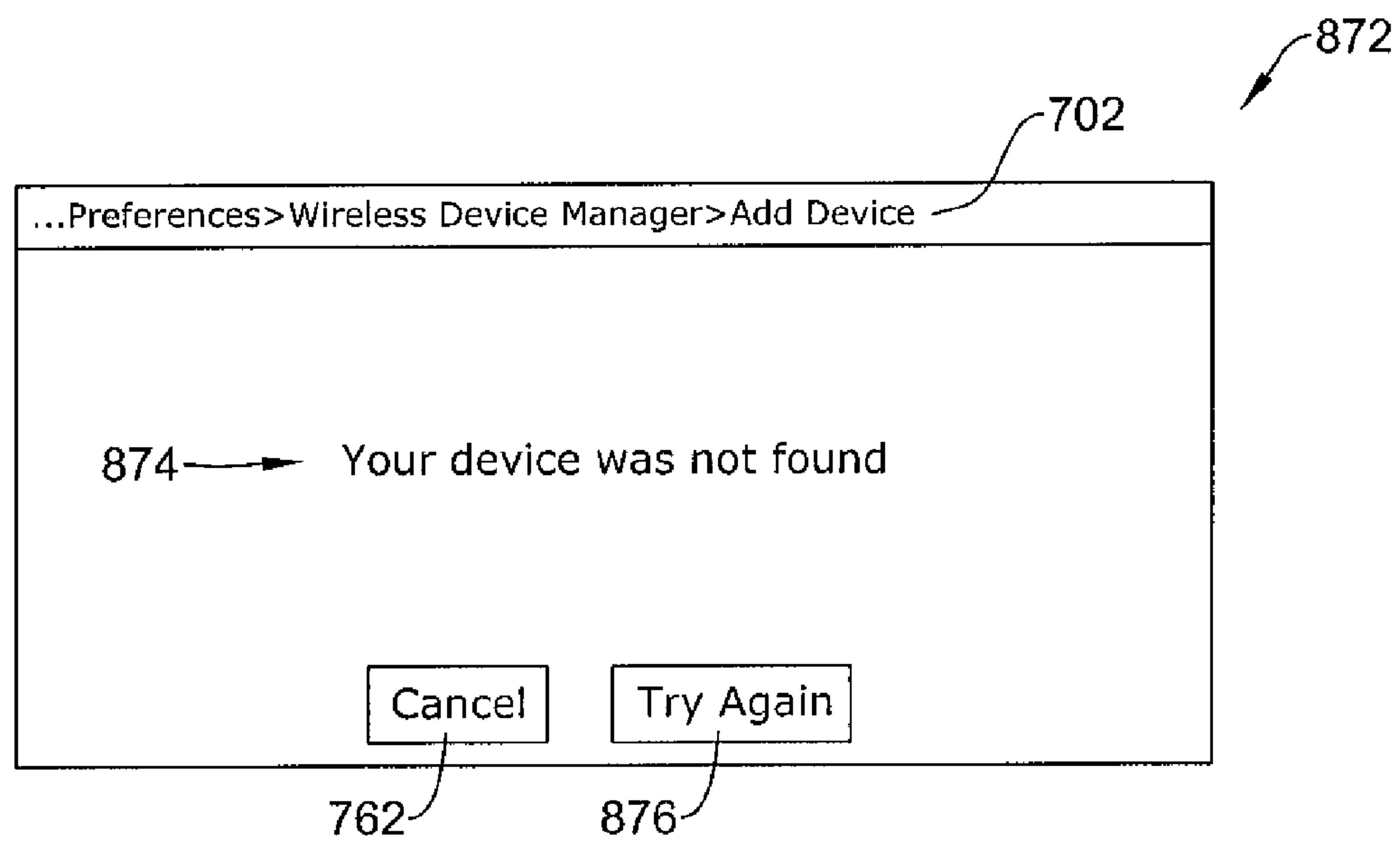
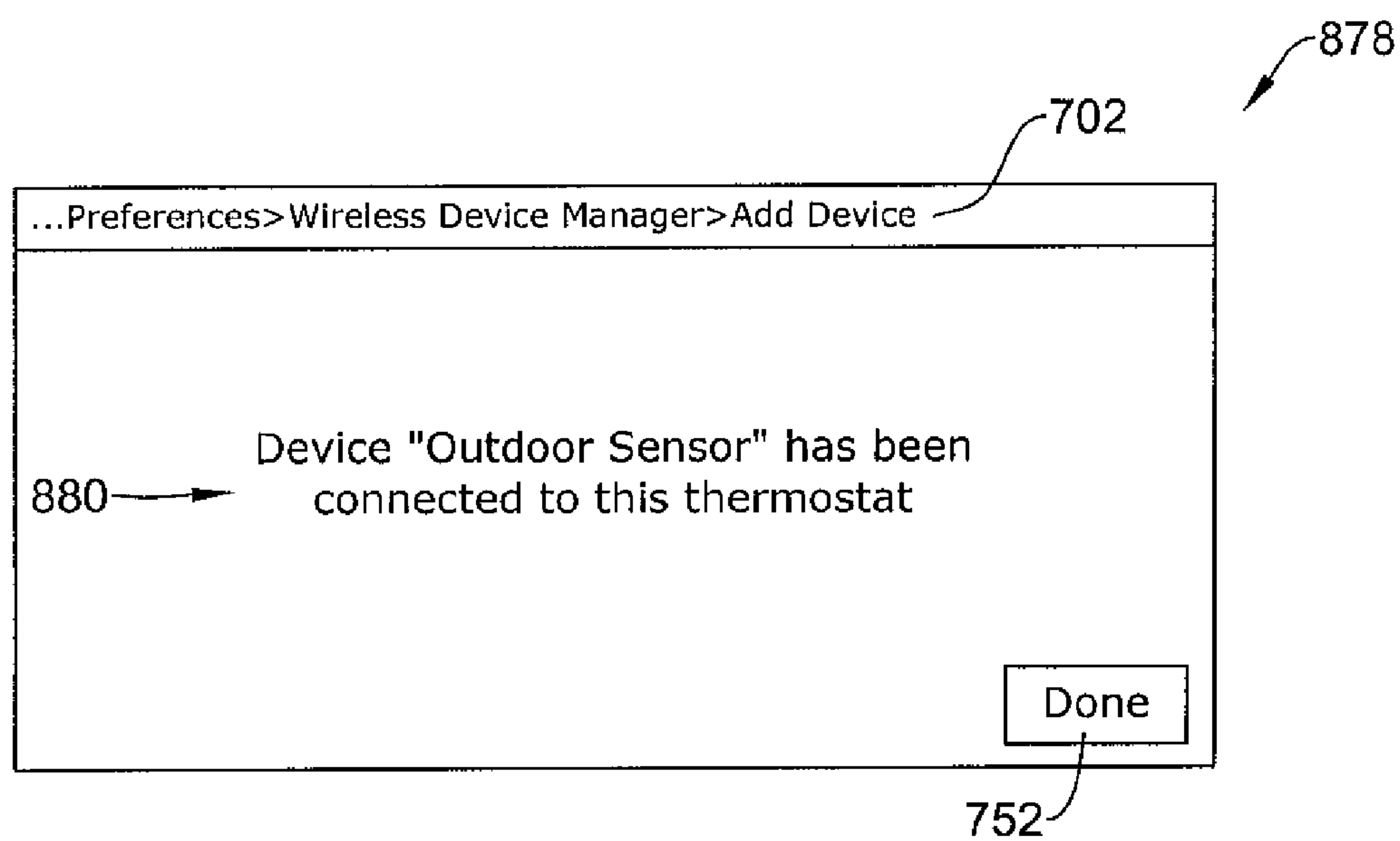
*Figure 80**Figure 81*

*Figure 82**Figure 83*

*Figure 84**Figure 85*

*Figure 86**Figure 87*

*Figure 88**Figure 89*

*Figure 90**Figure 91*

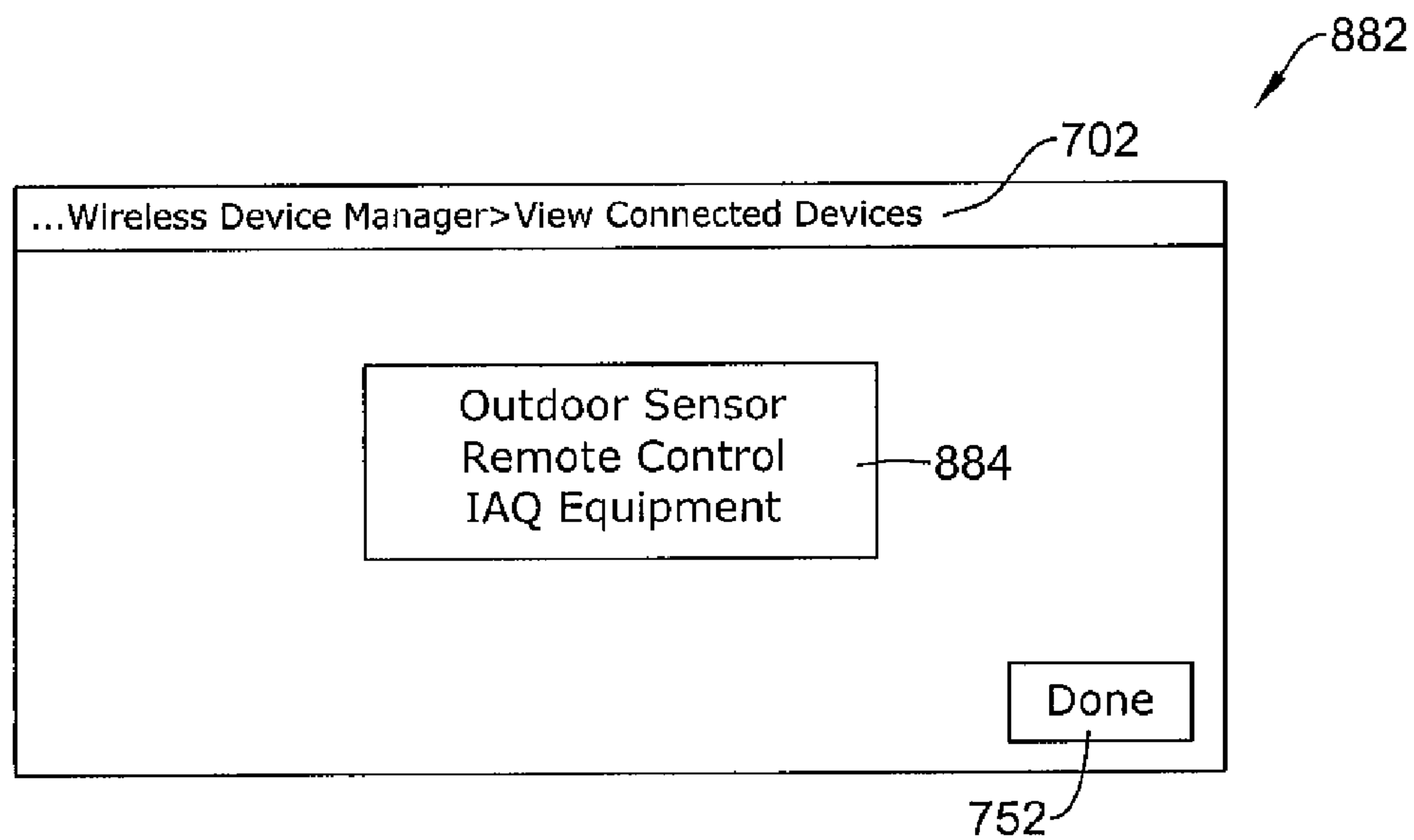


Figure 92

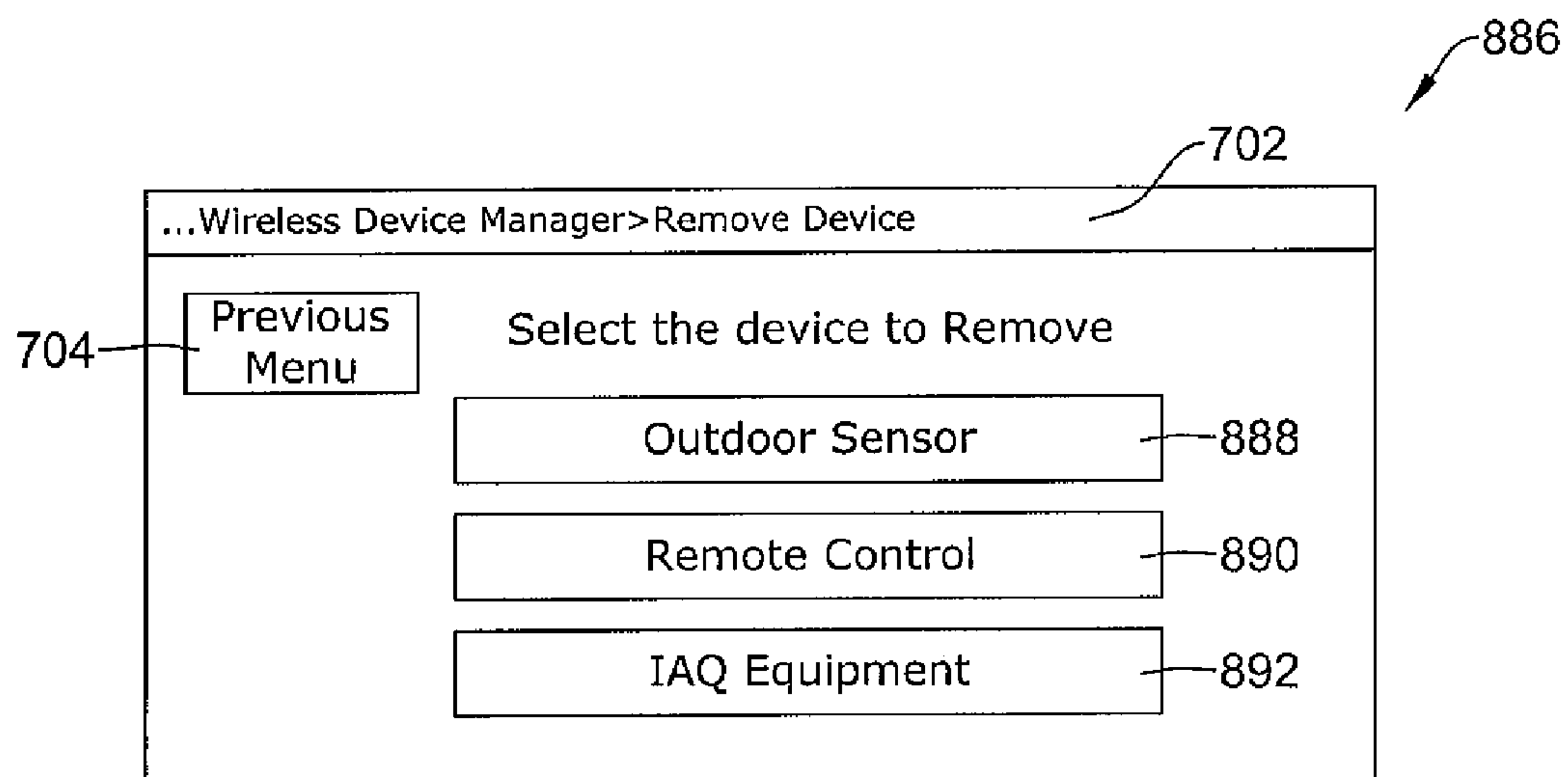
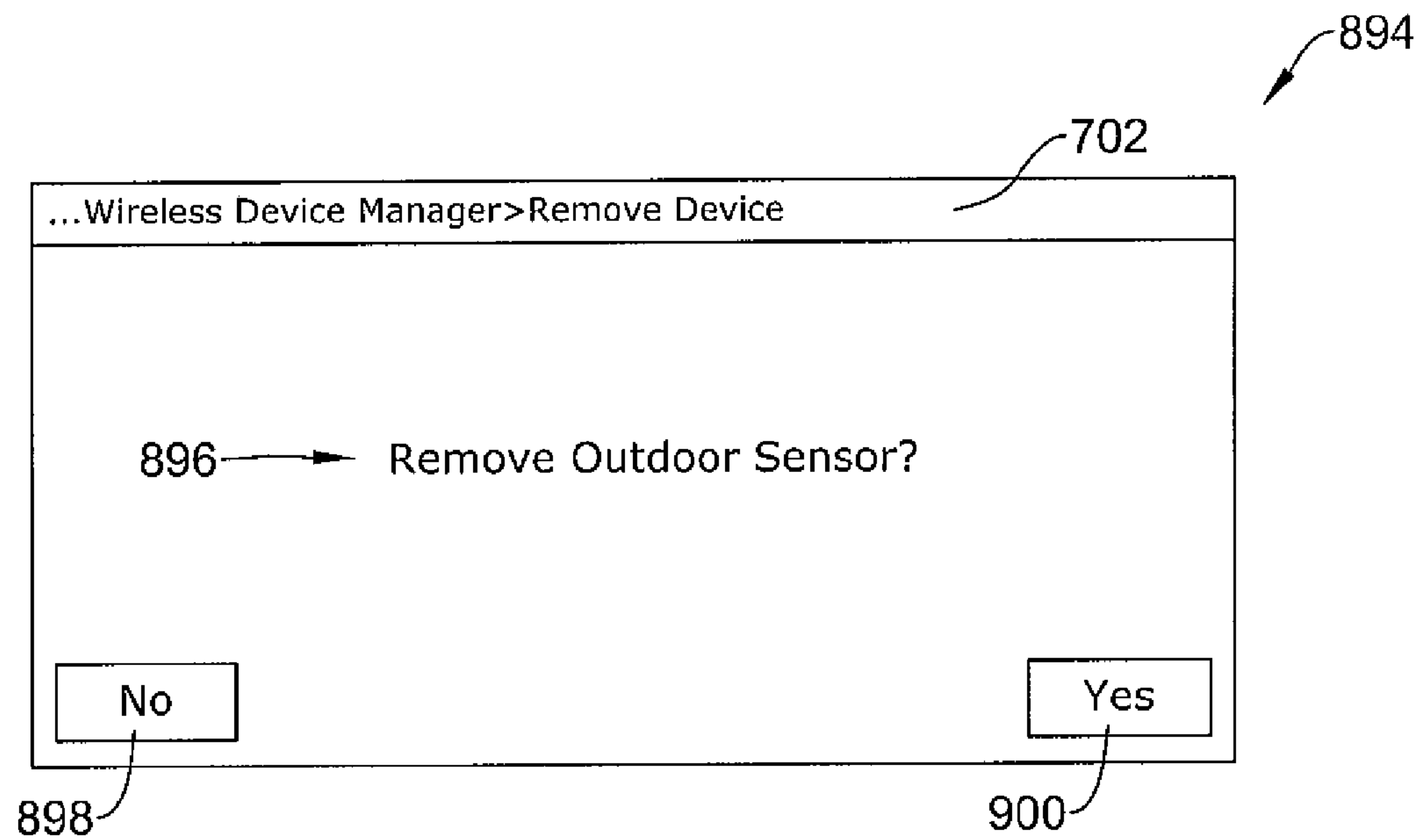
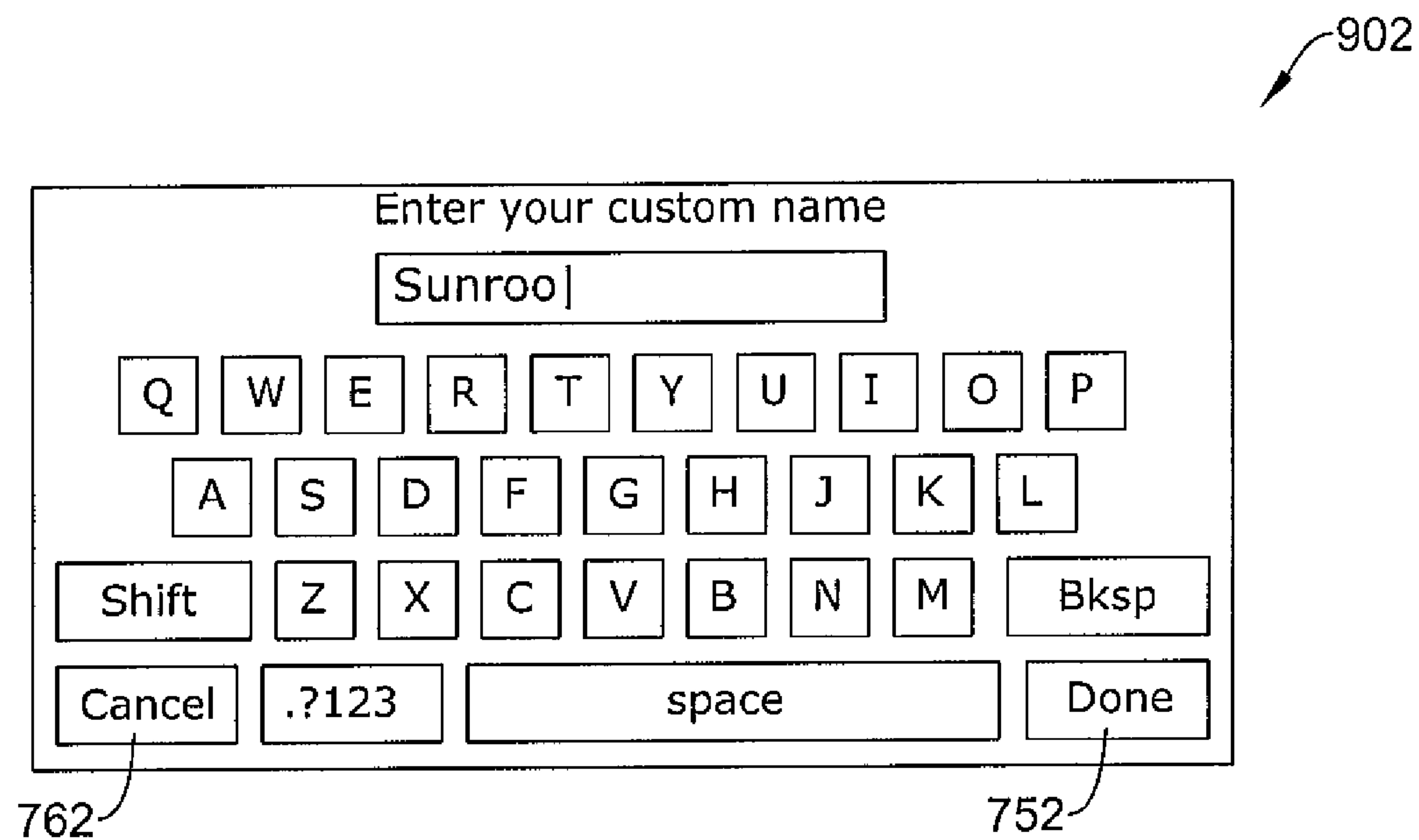


Figure 93

*Figure 94**Figure 95*

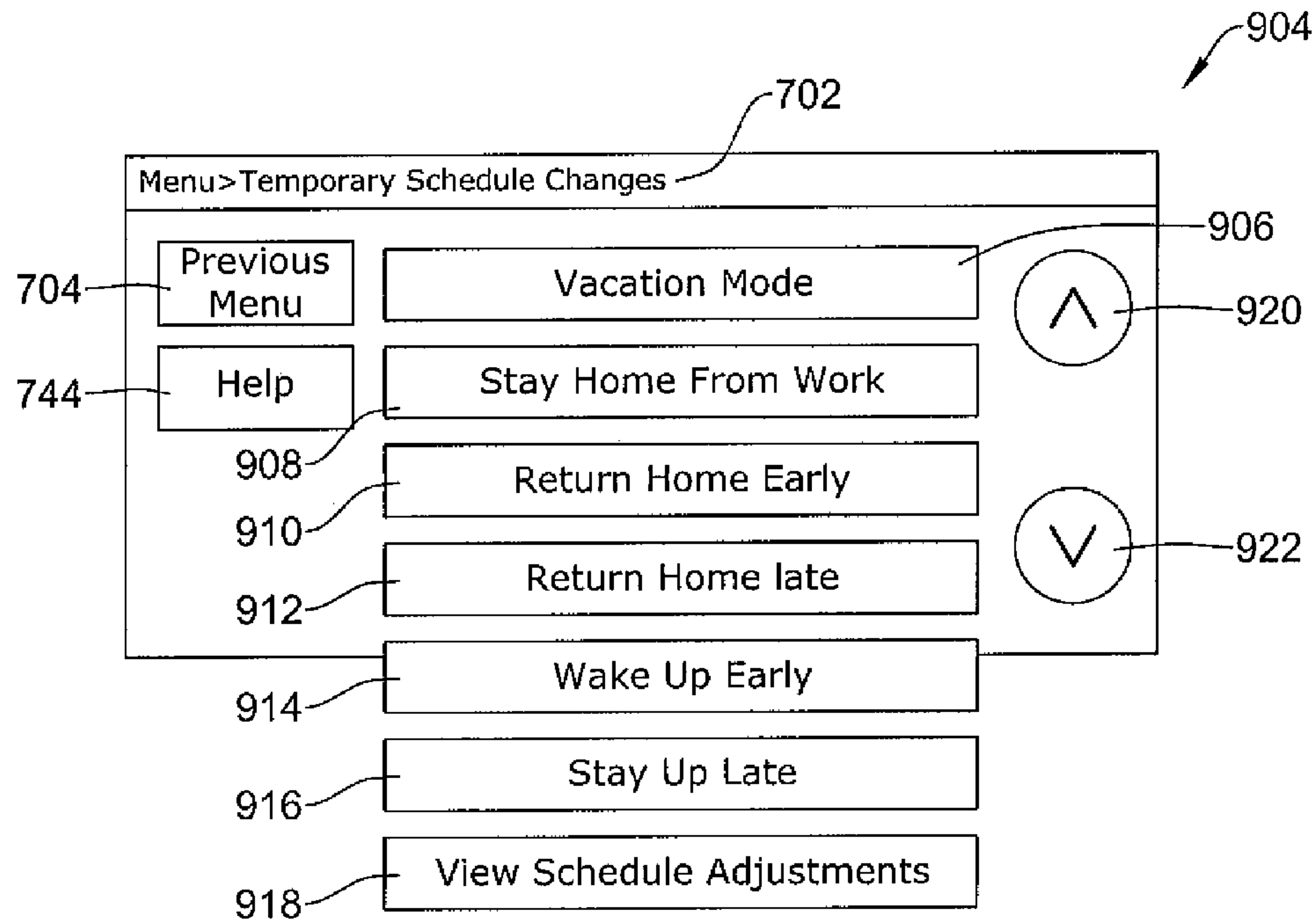


Figure 96

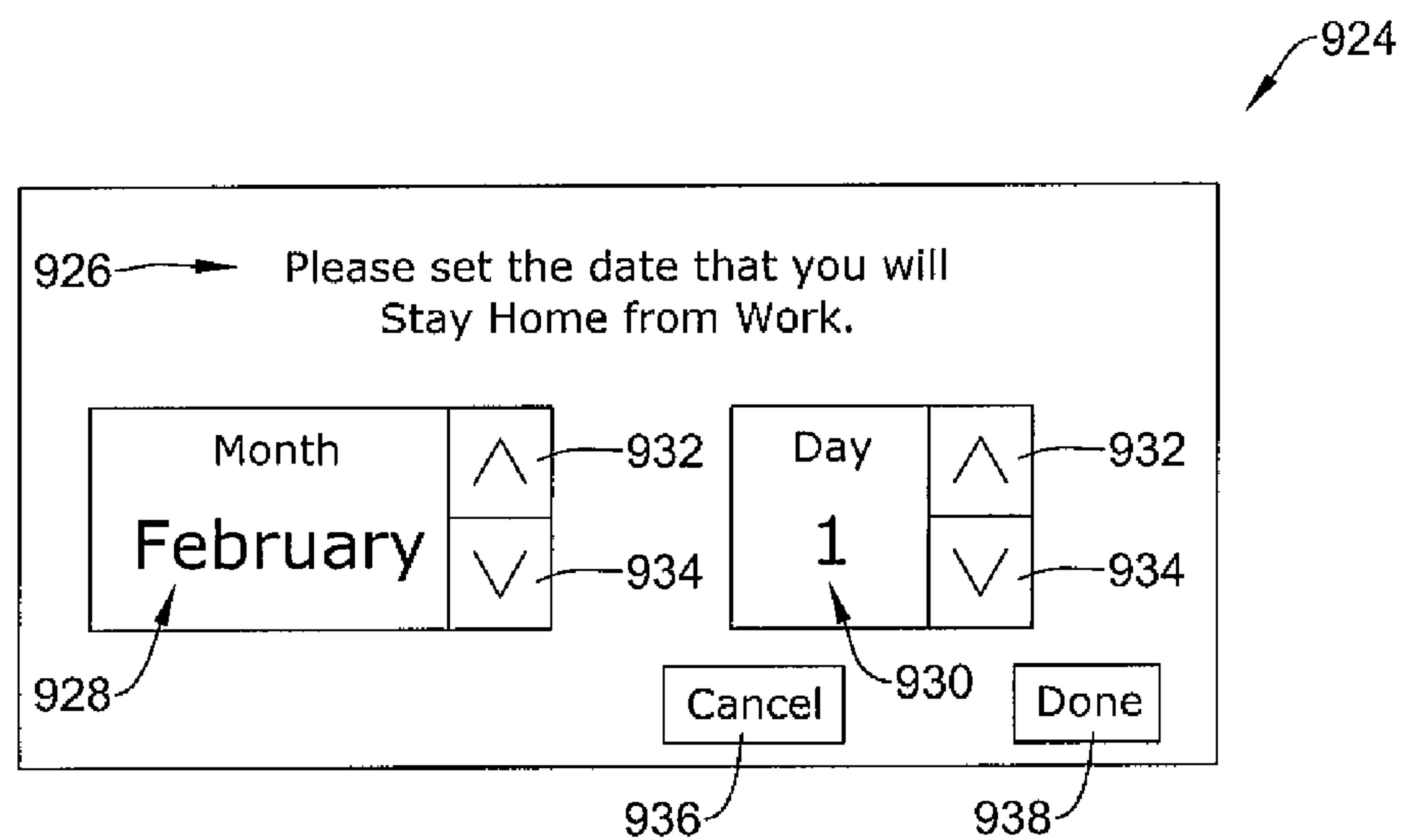


Figure 97

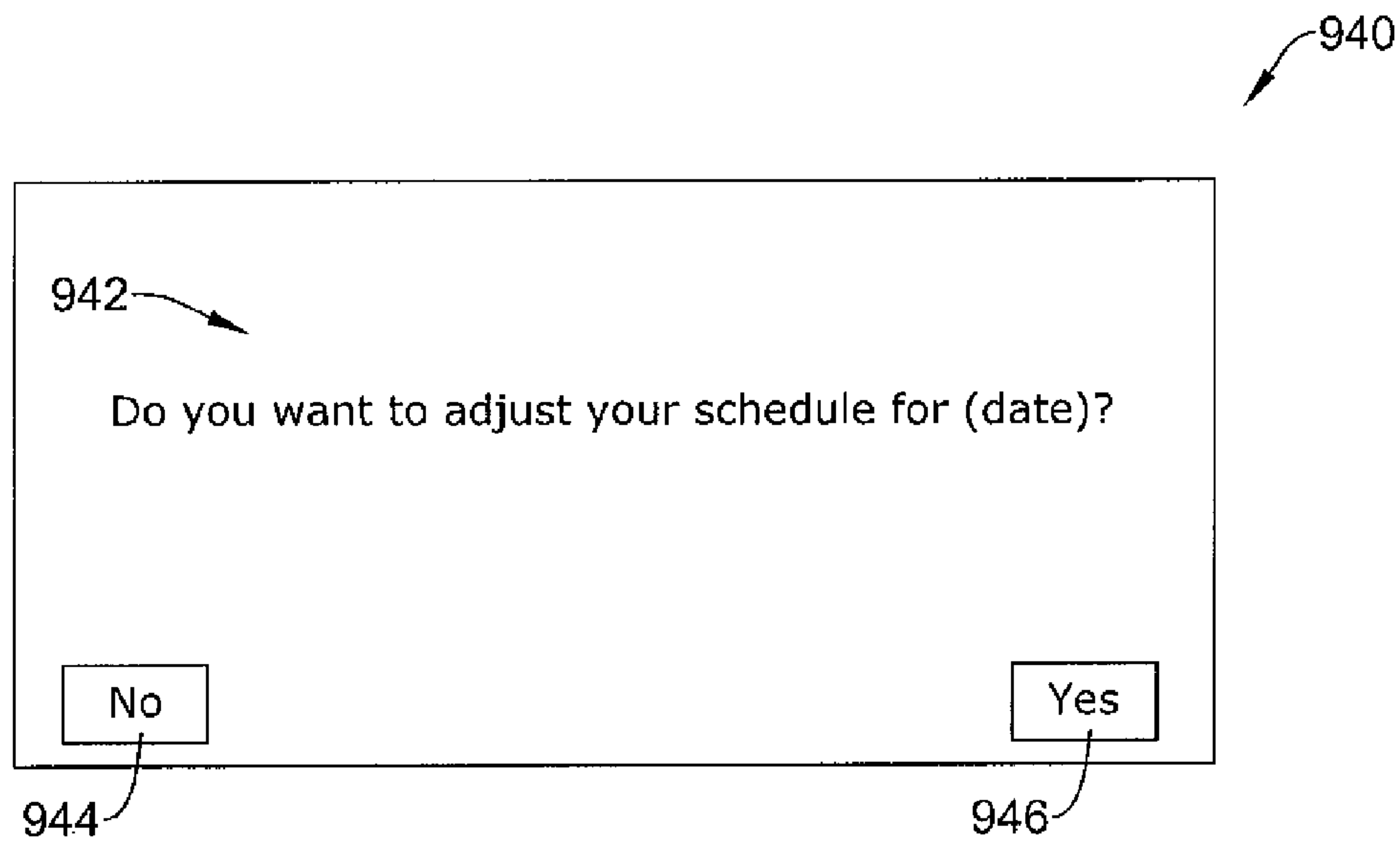


Figure 98

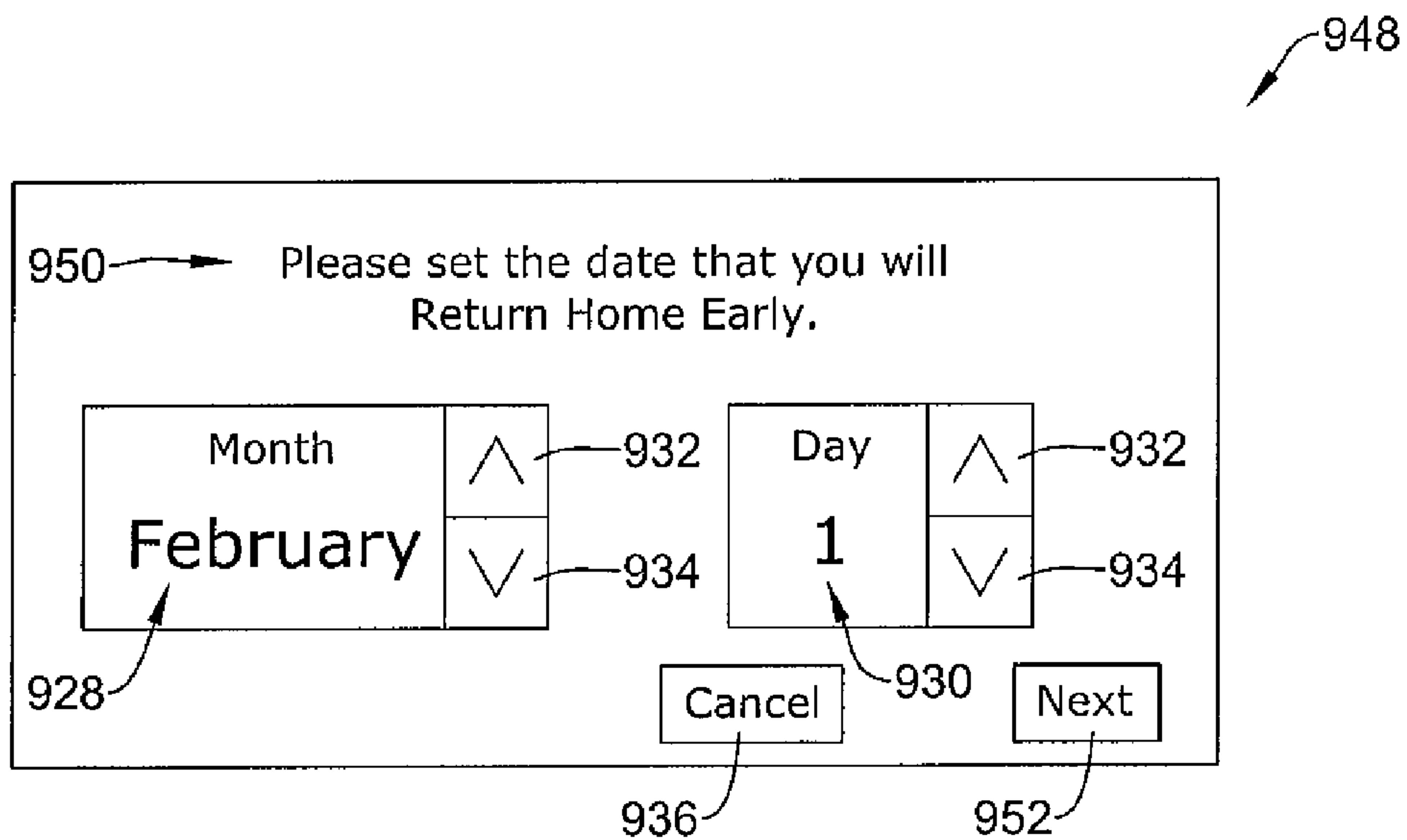
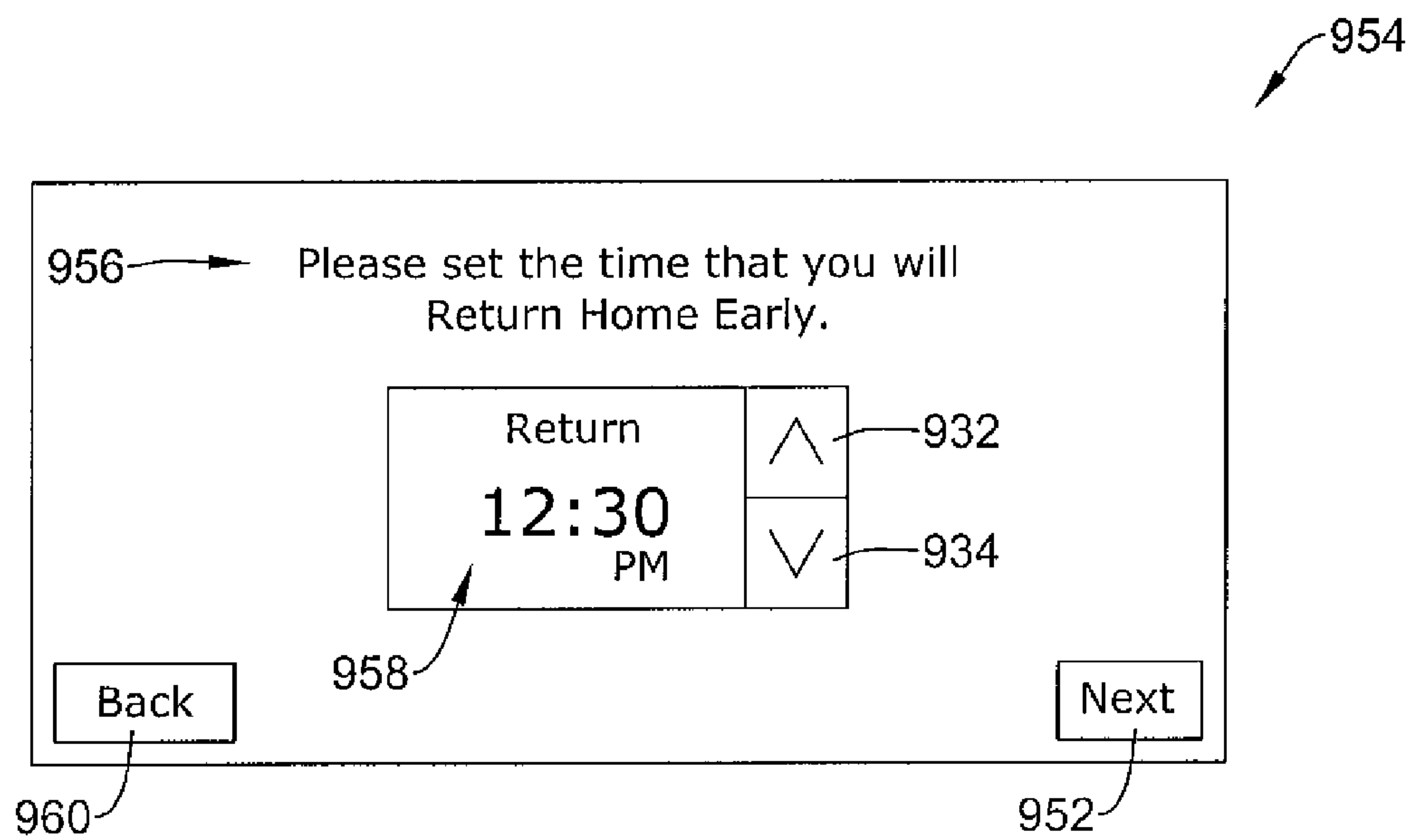
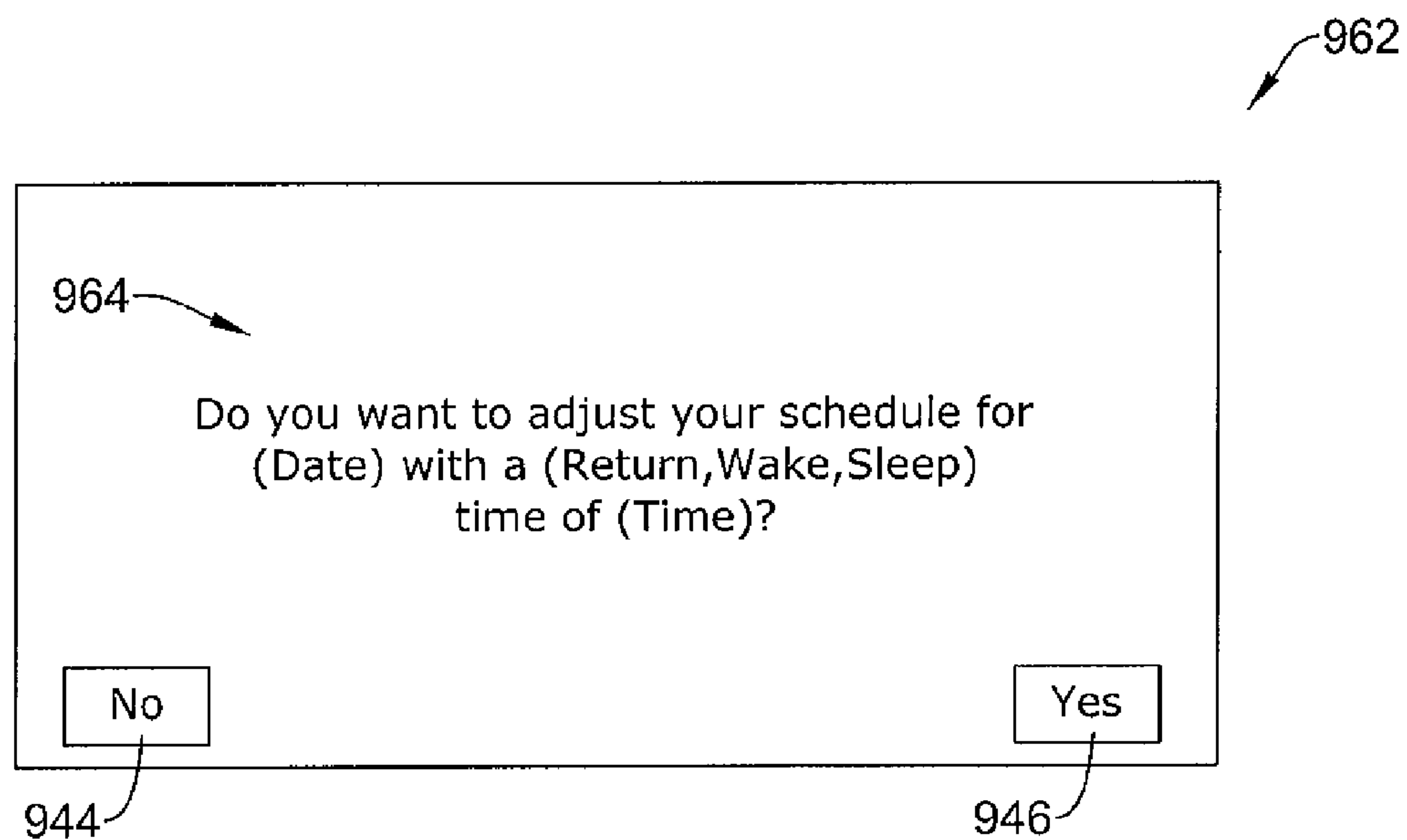


Figure 99

*Figure 100**Figure 101*

966

968 → Please set the date that you will Return Home Late.

Month	^ 932	Day	^ 932
February 928	v 934	1 930	v 934

Cancel 936 Next 952

Figure 102

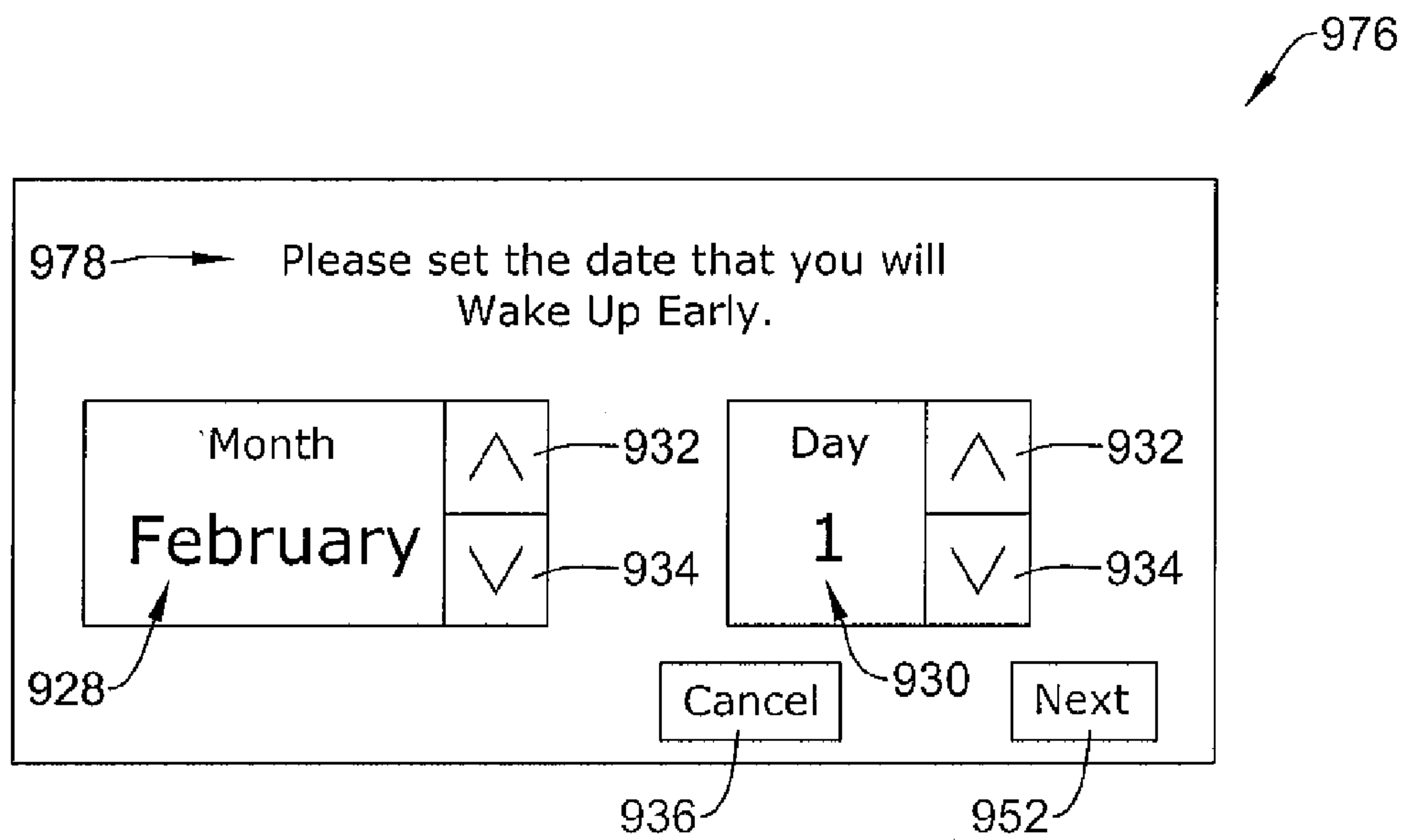
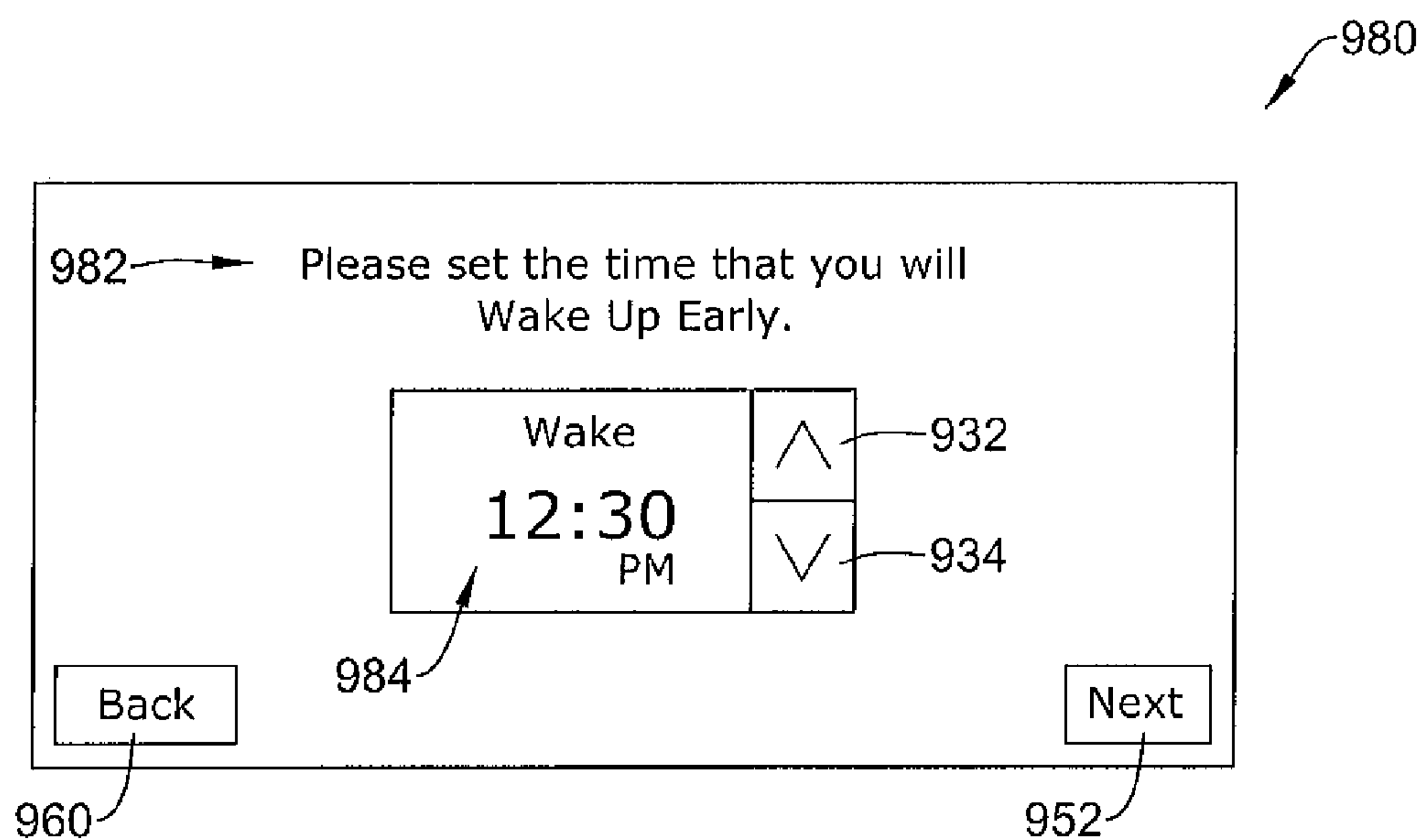
970

972 → Please set the time that you will Return Home Late.

Return	^ 932
12:30 PM 974	v 934

Back 960 Next 952

Figure 103

*Figure 104**Figure 105*

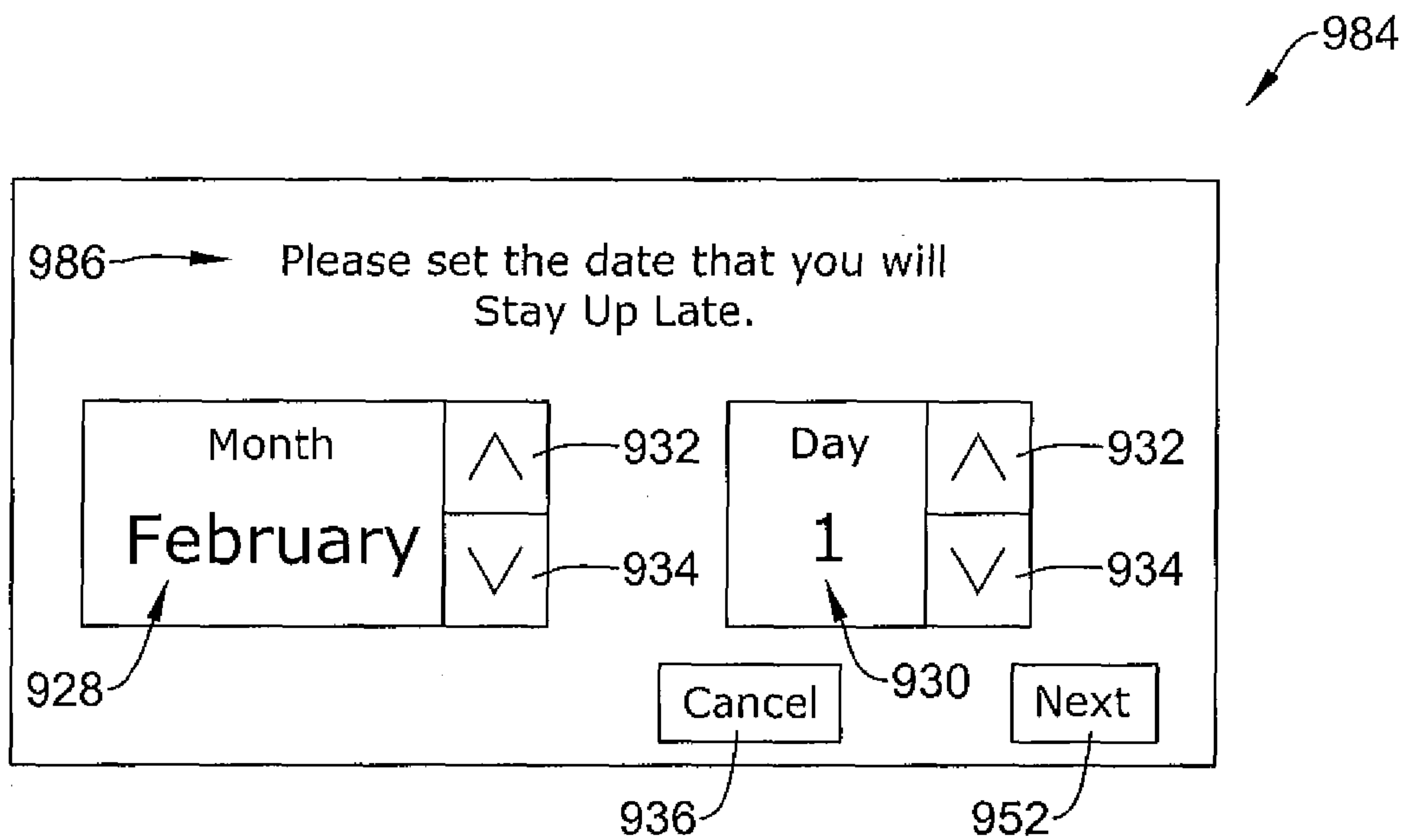


Figure 106

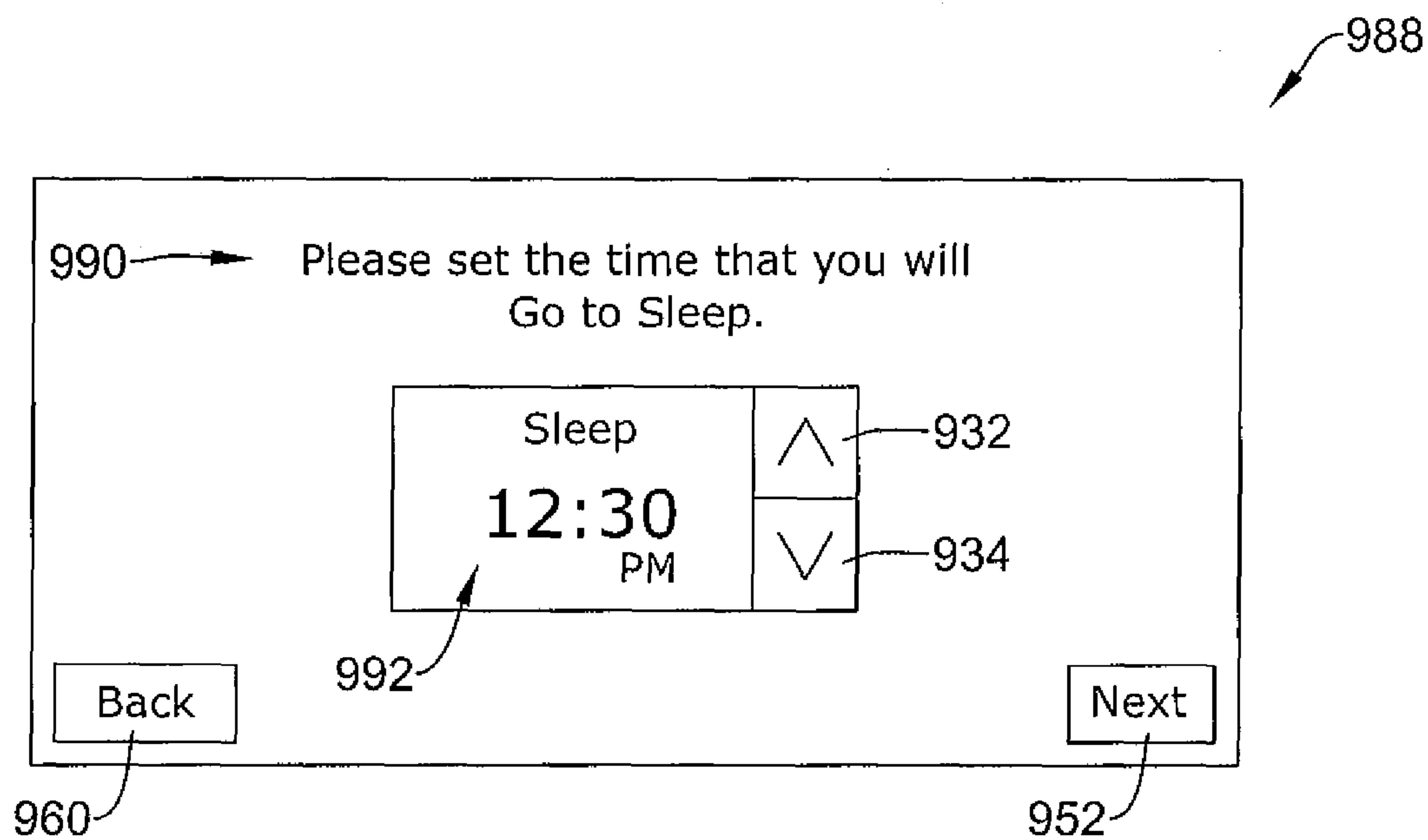
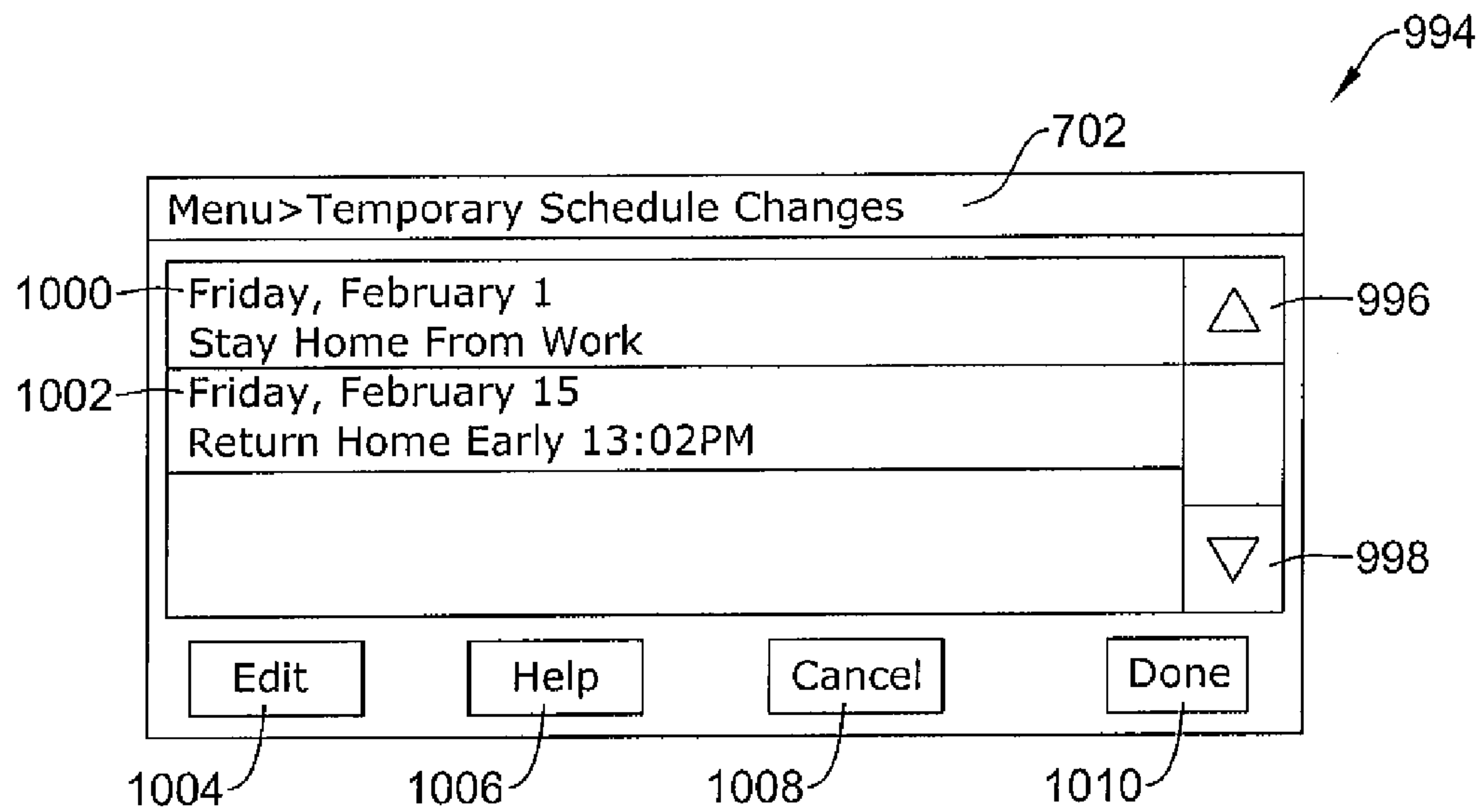
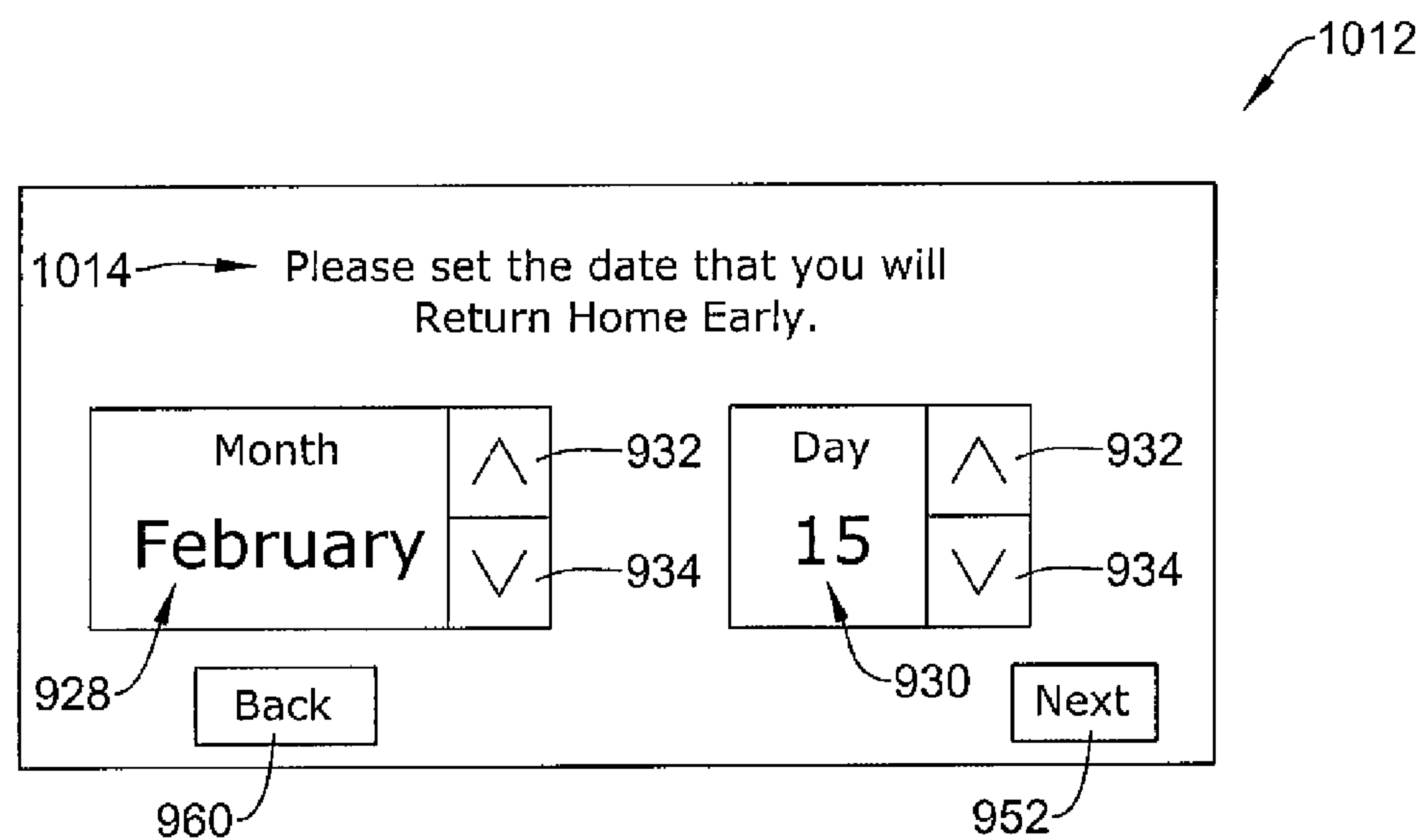
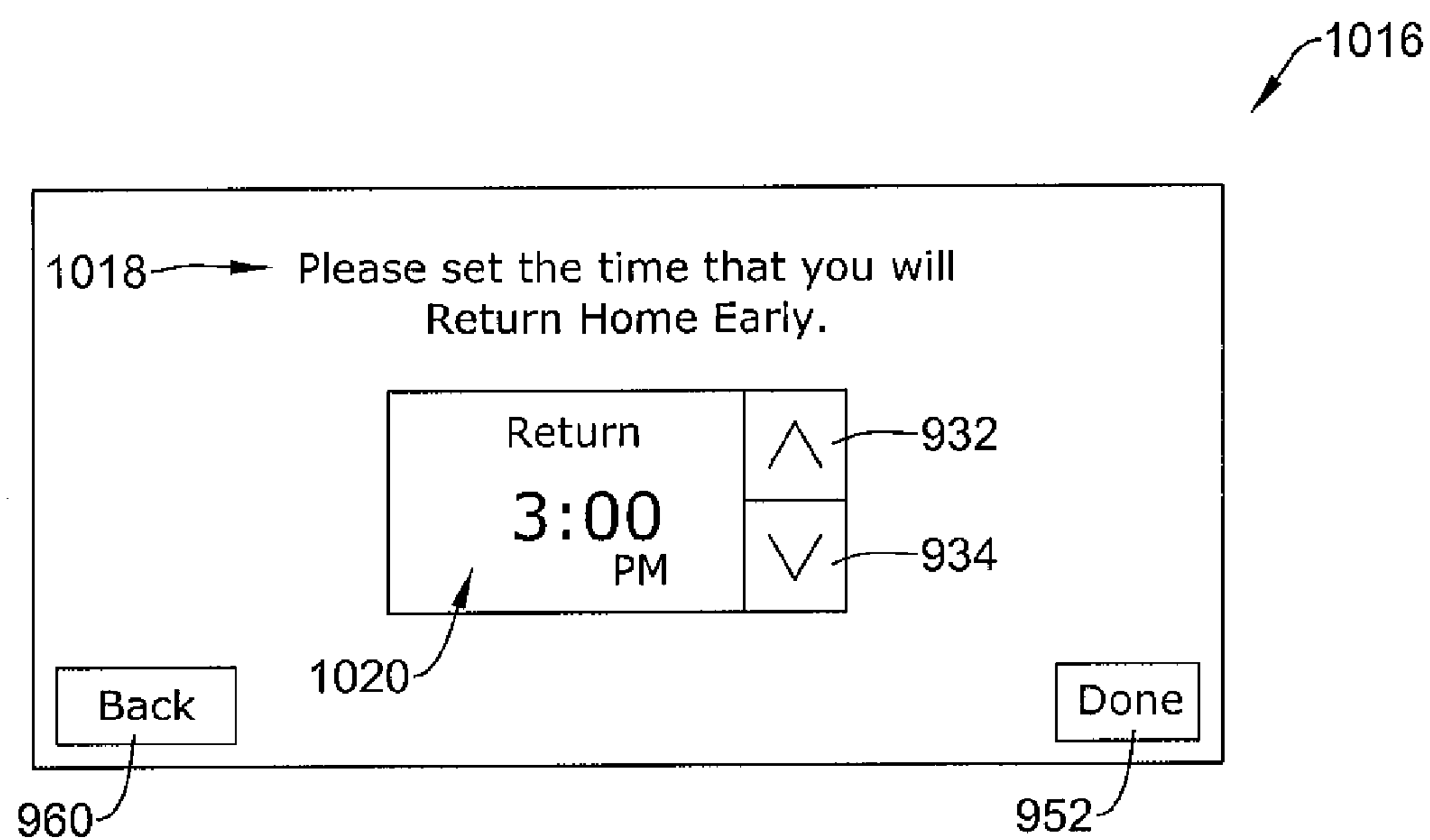
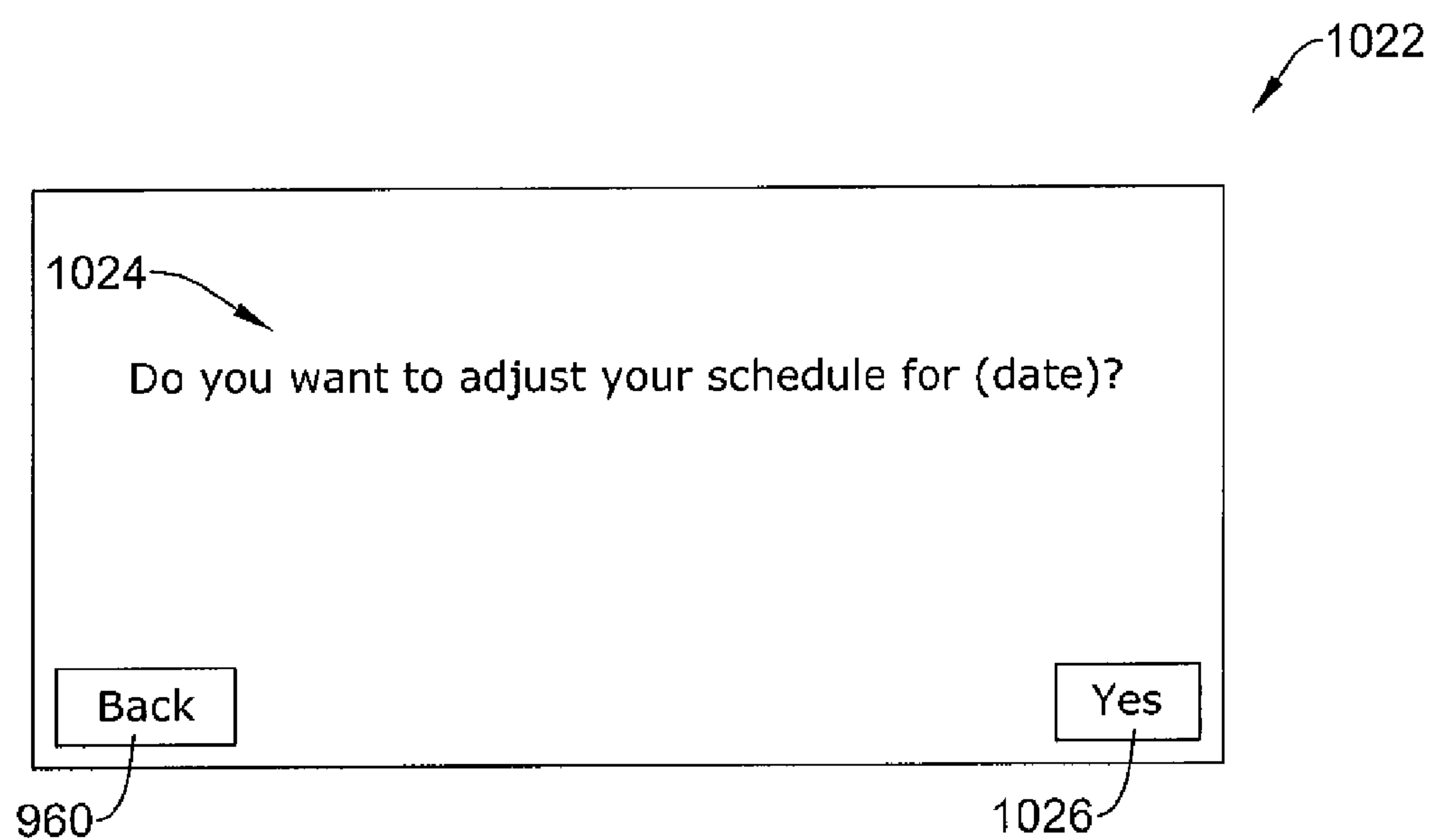
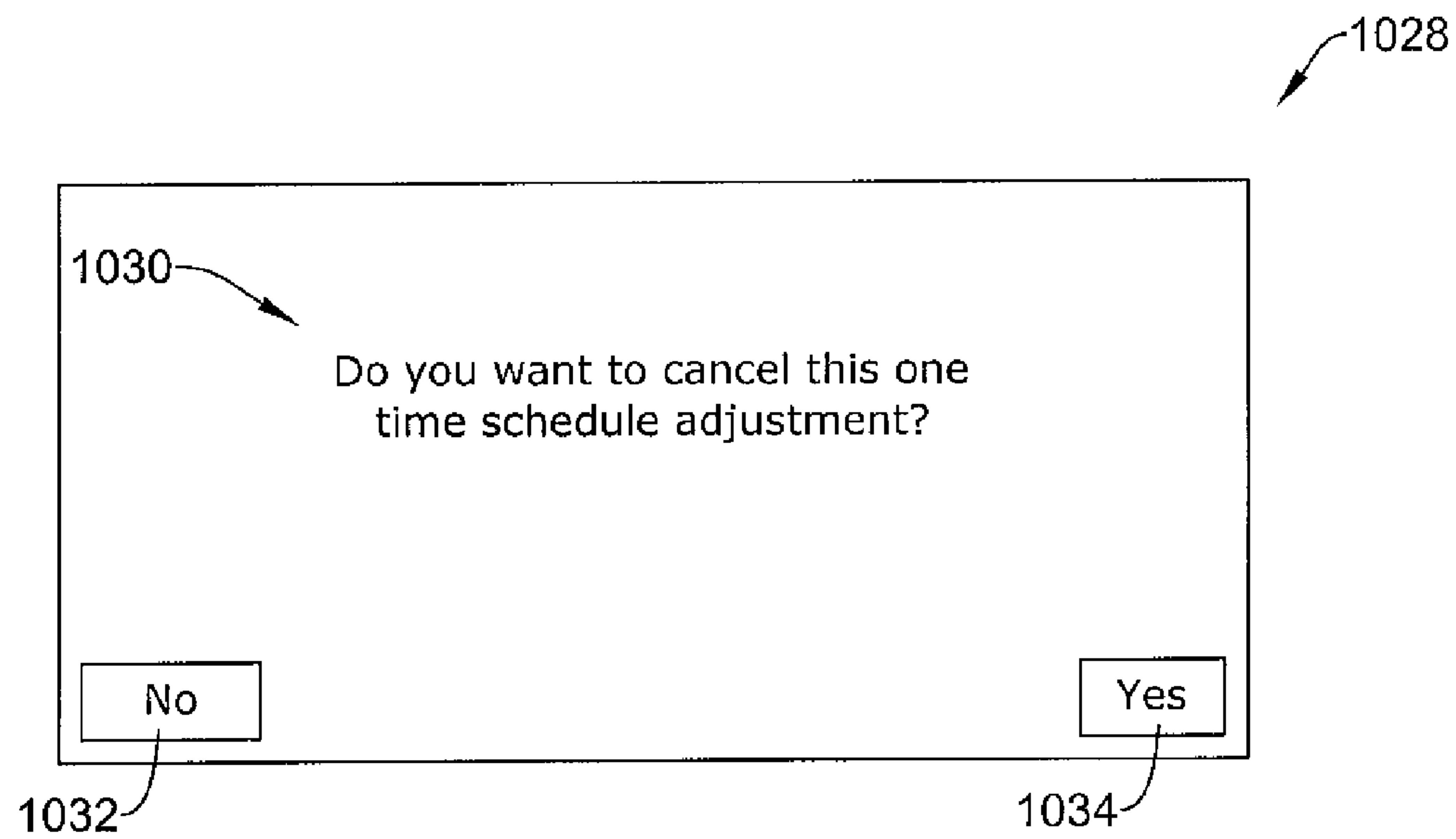
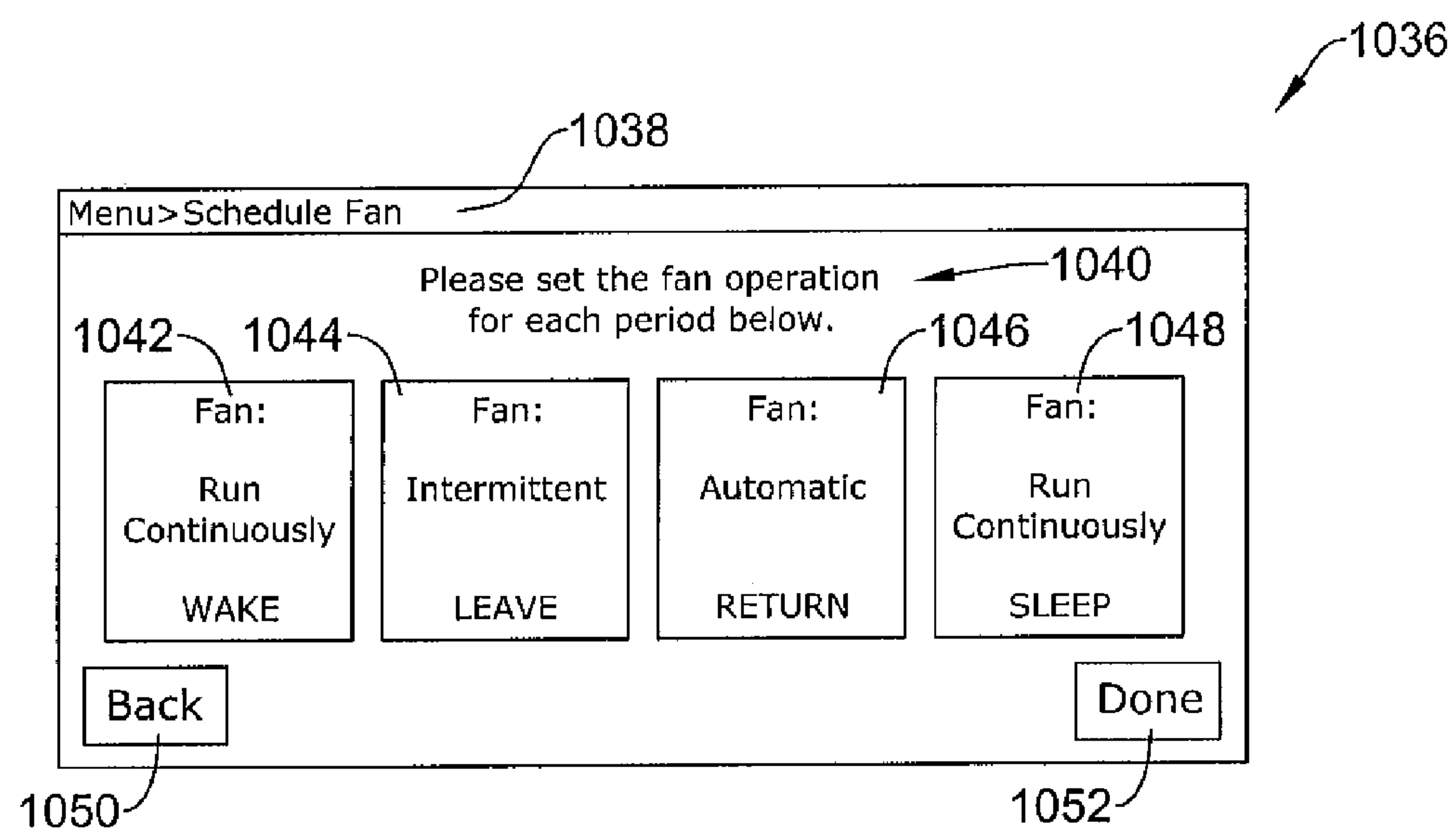
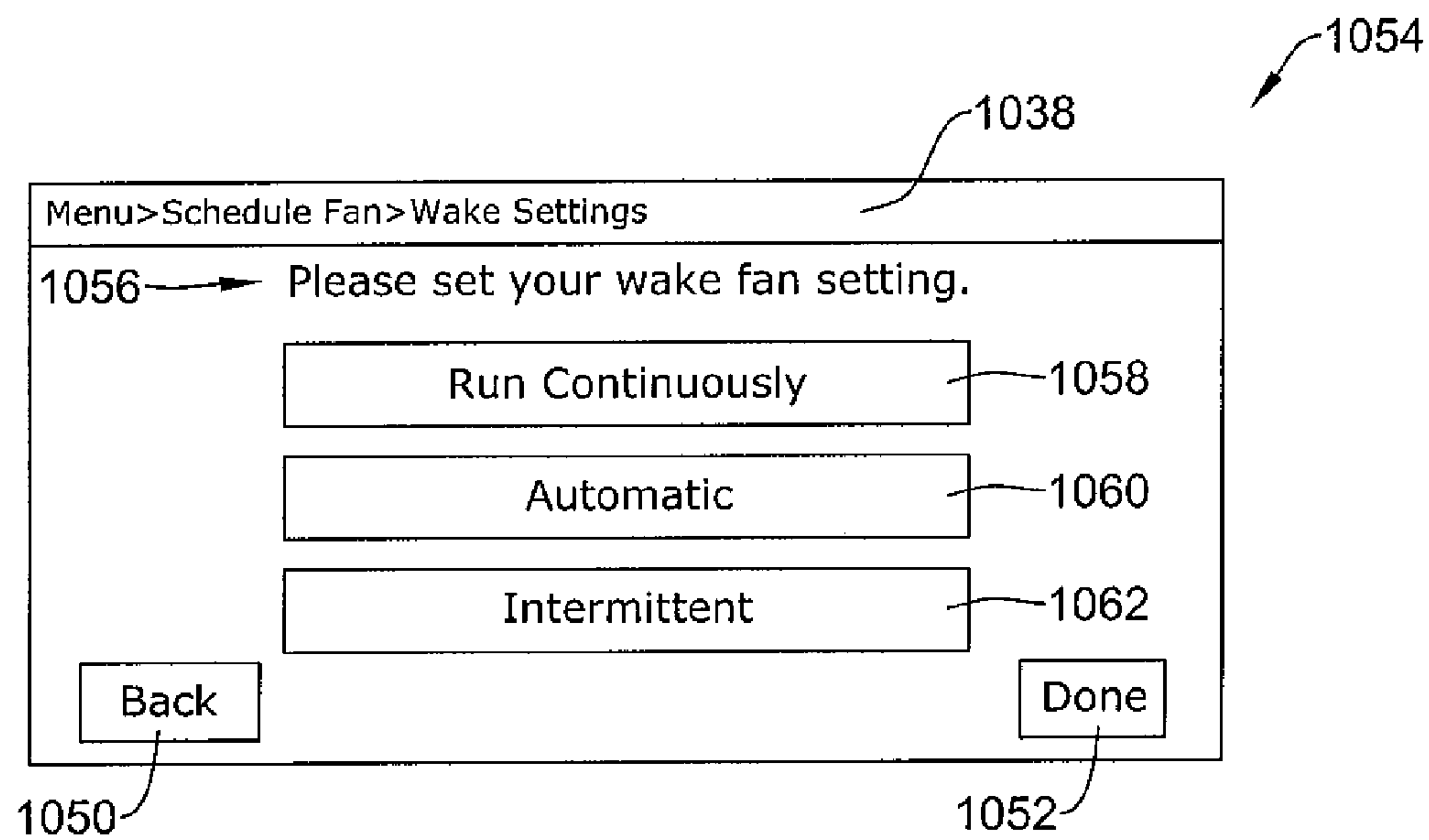
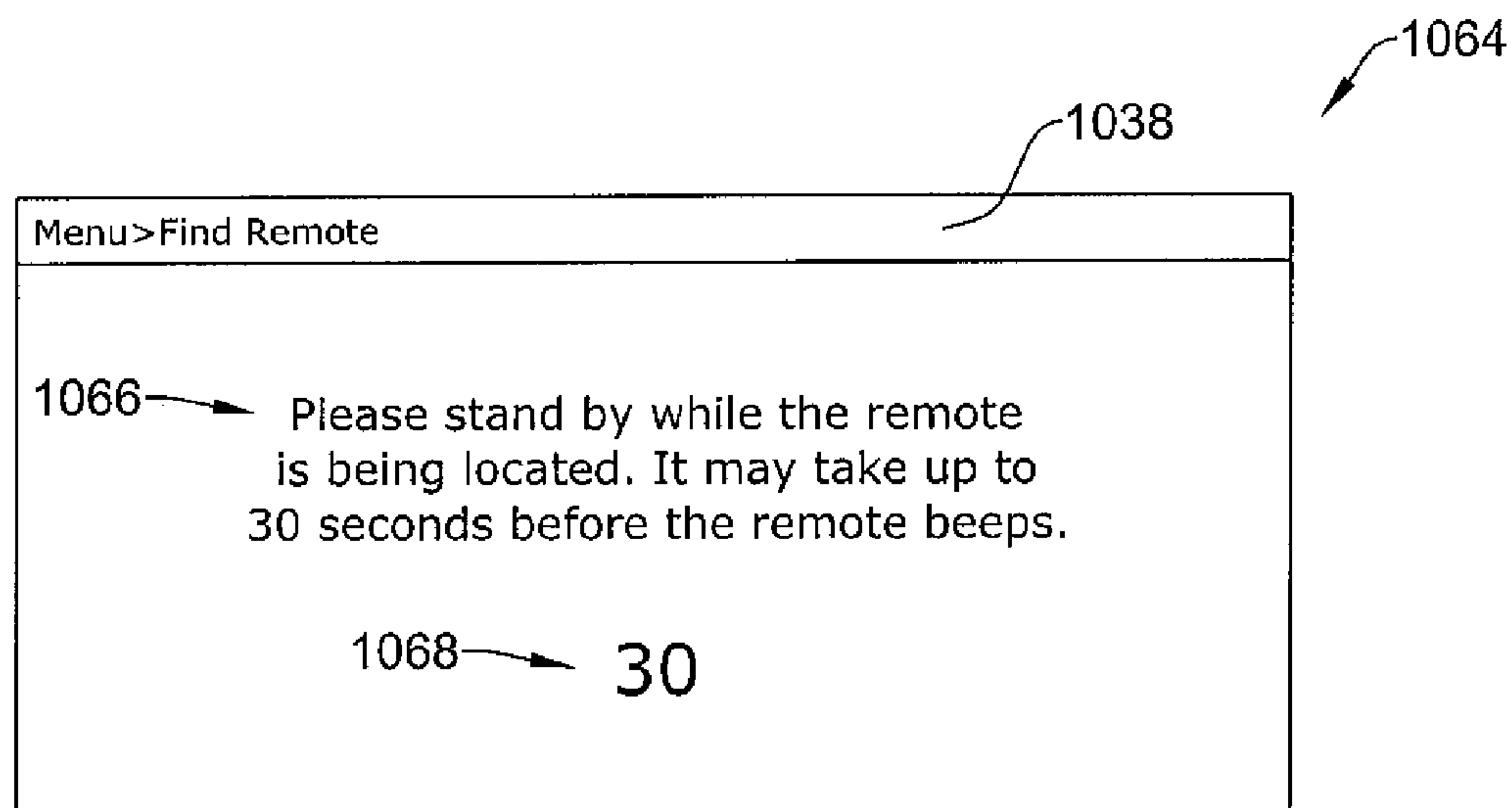


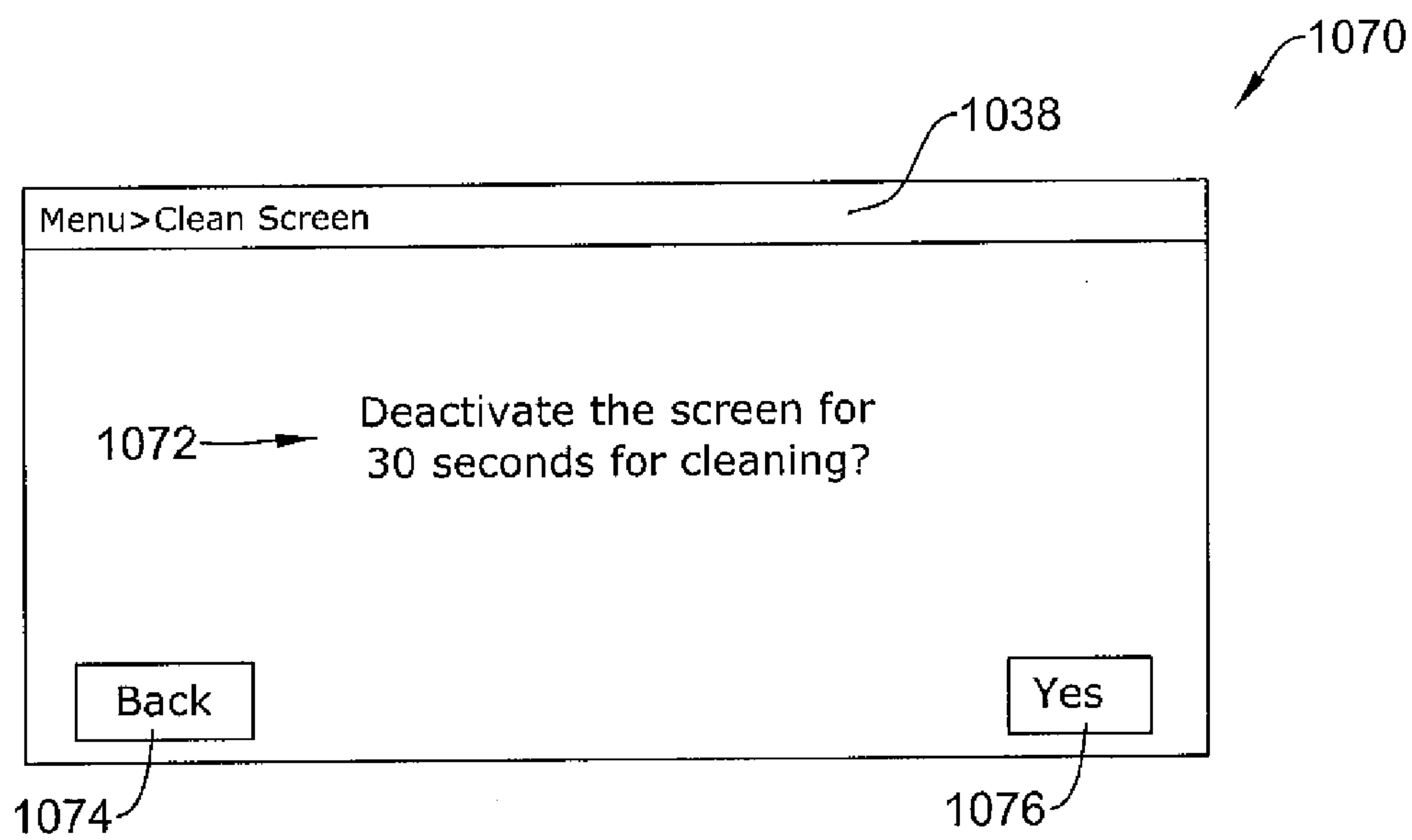
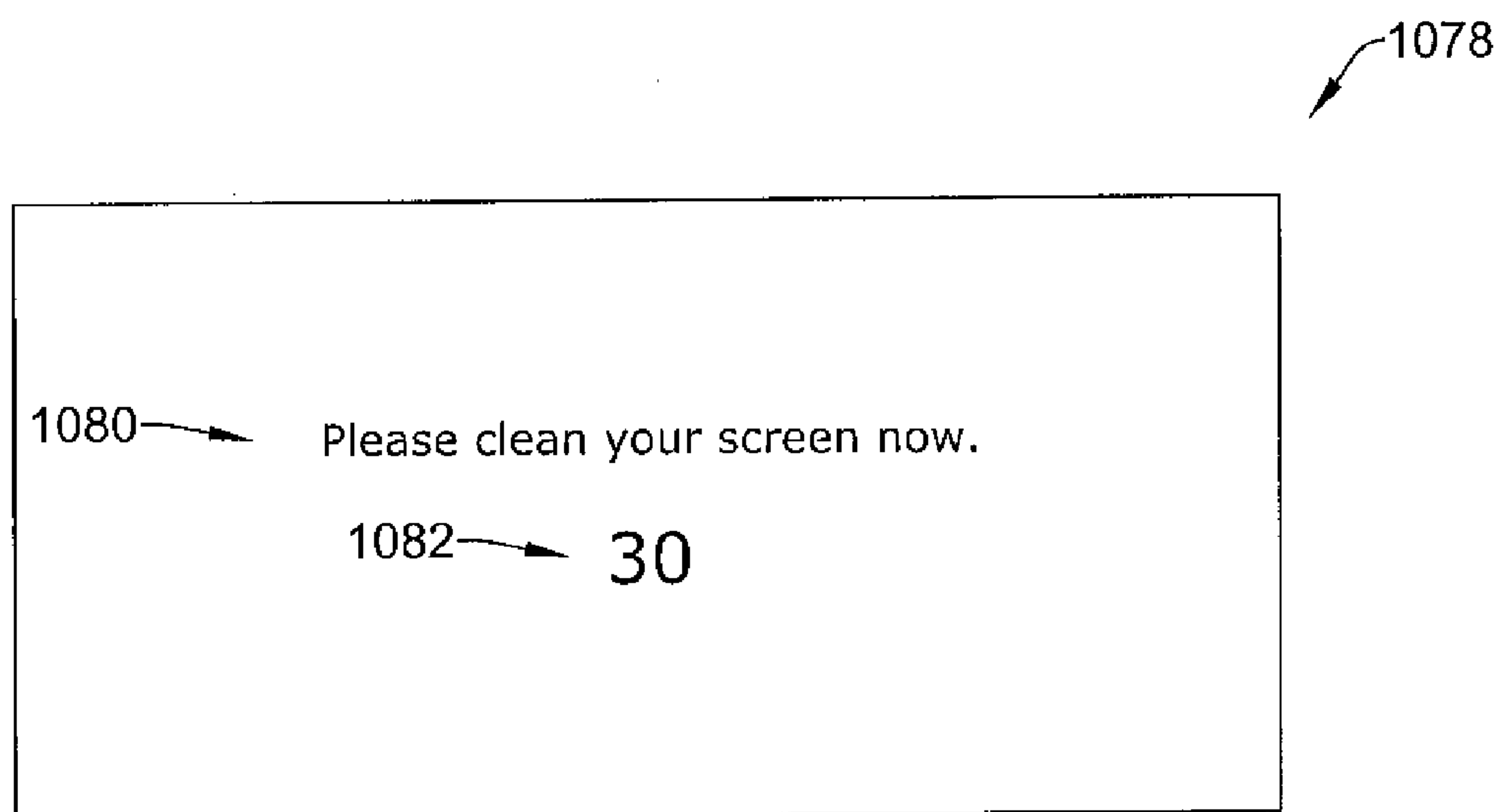
Figure 107

*Figure 108**Figure 109*

*Figure 110**Figure 111*

*Figure 112**Figure 113*

*Figure 114**Figure 115*

*Figure 116**Figure 117*

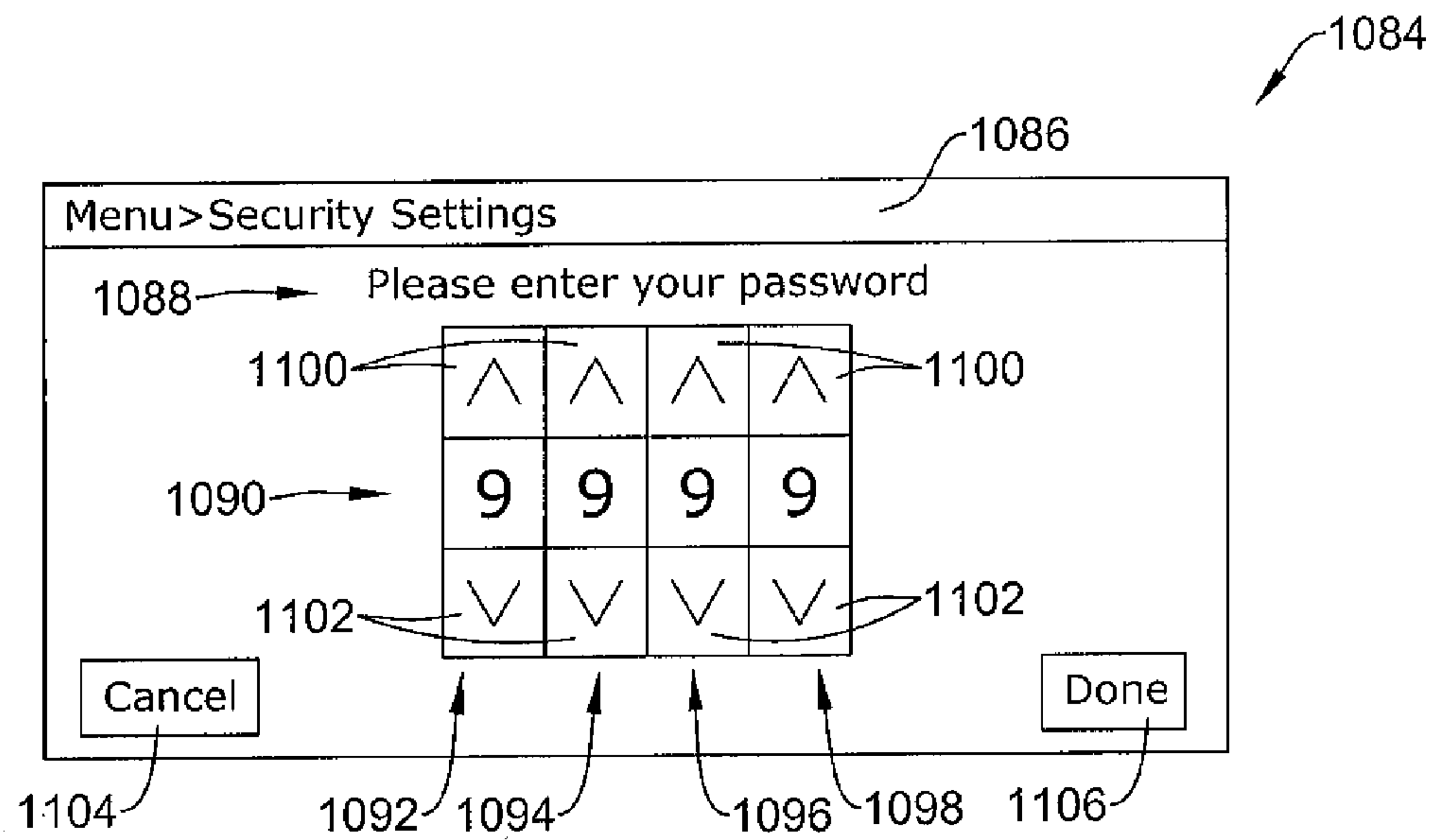


Figure 118

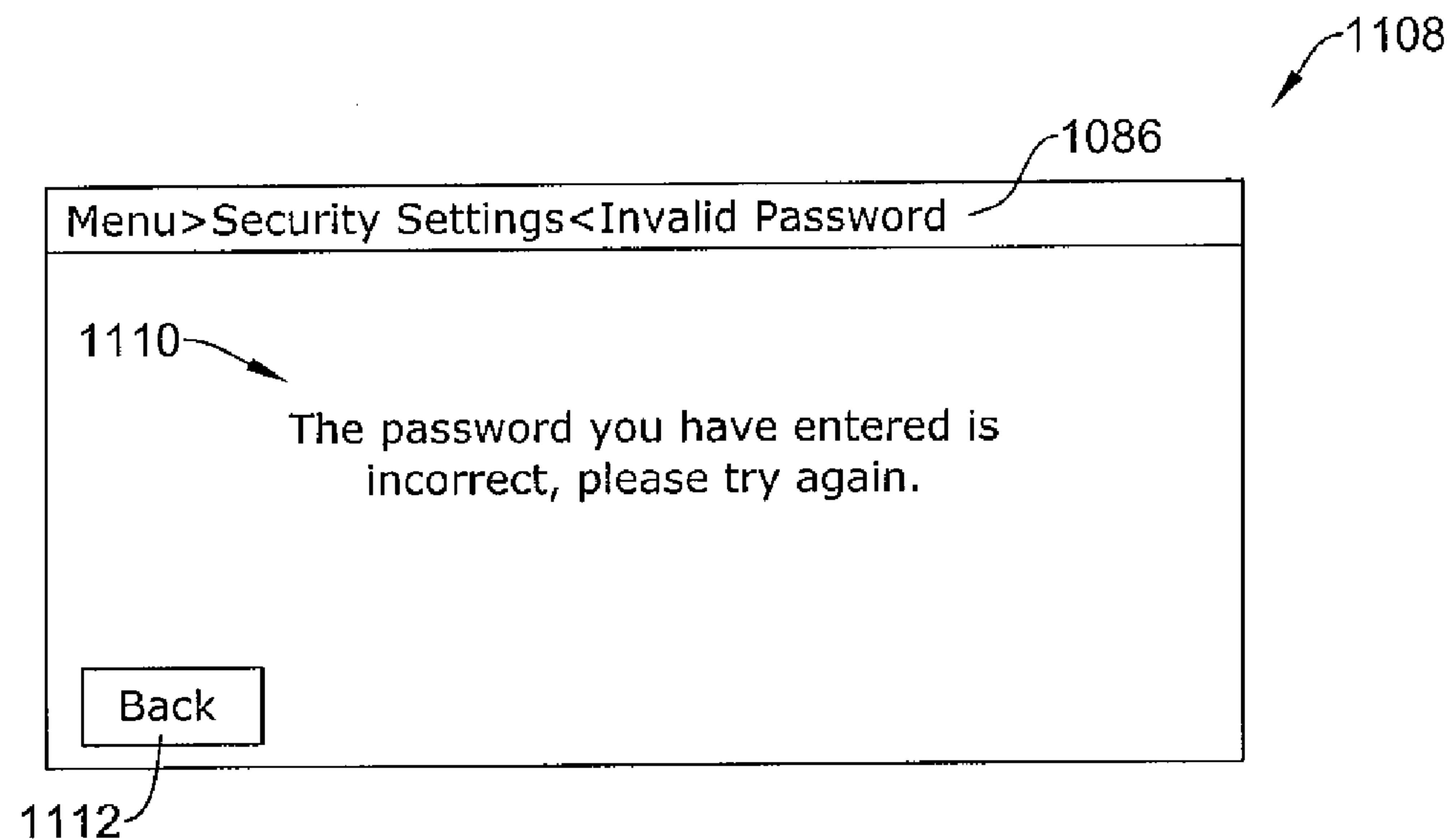


Figure 119

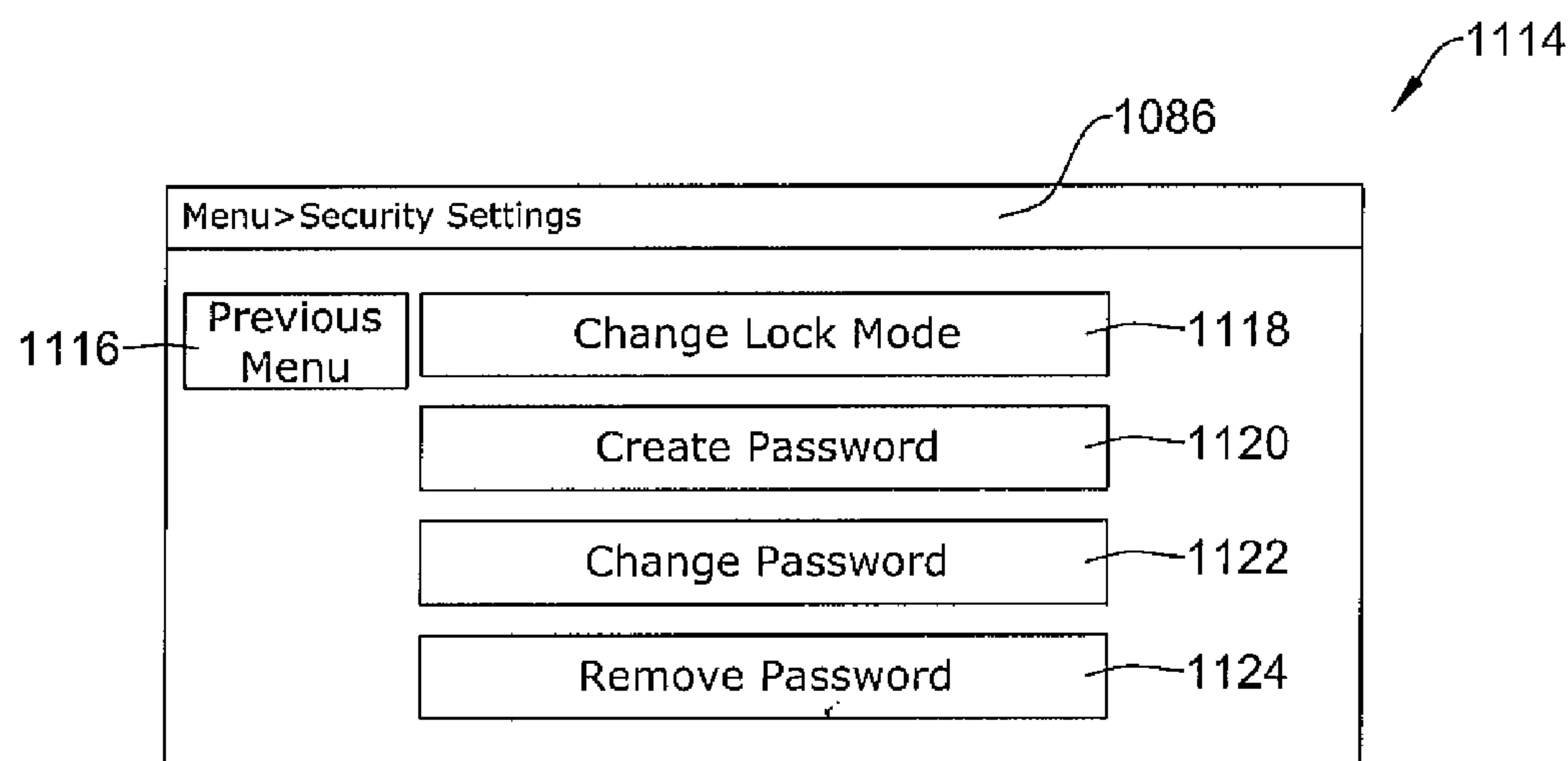


Figure 120

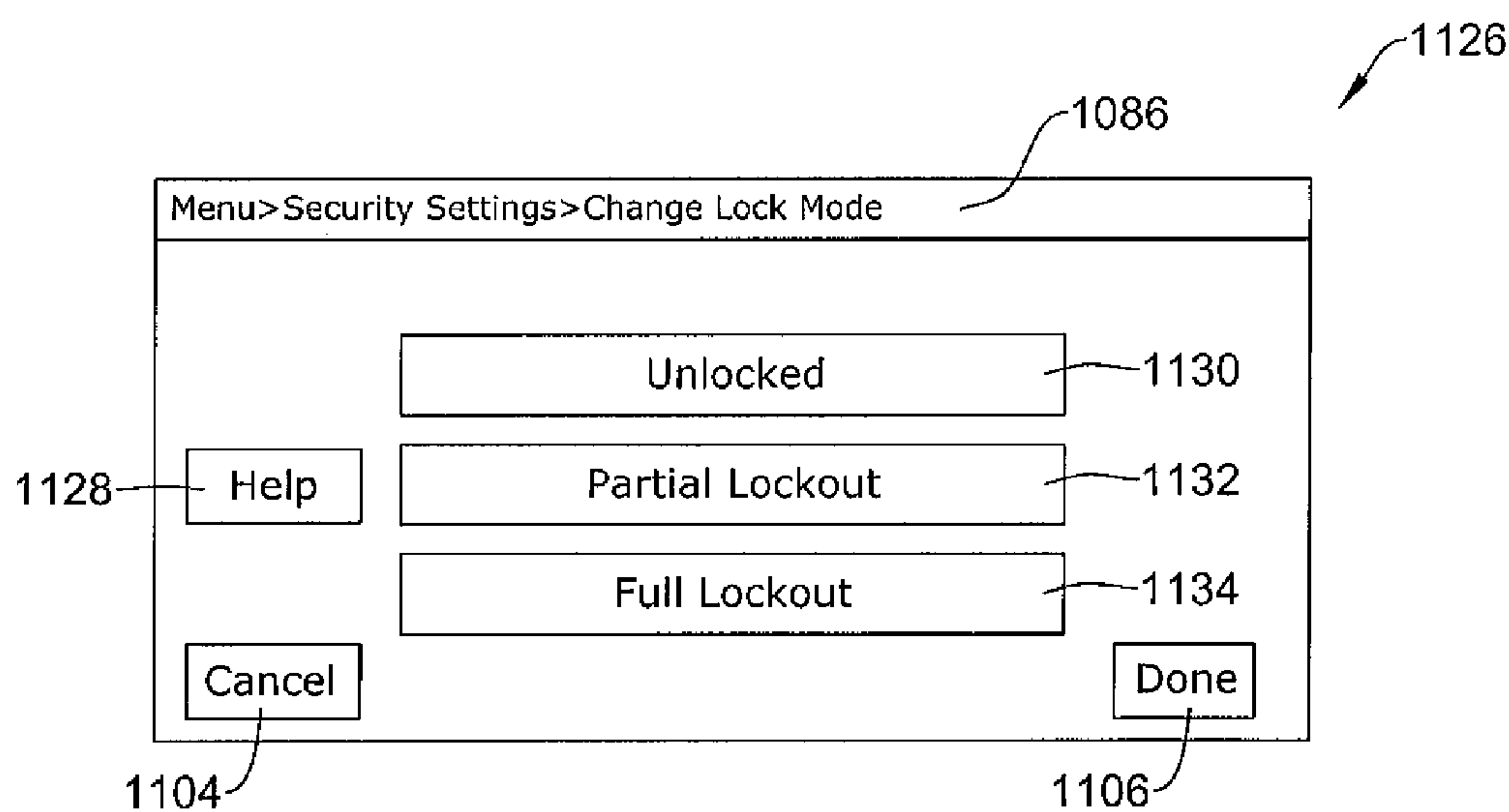


Figure 121

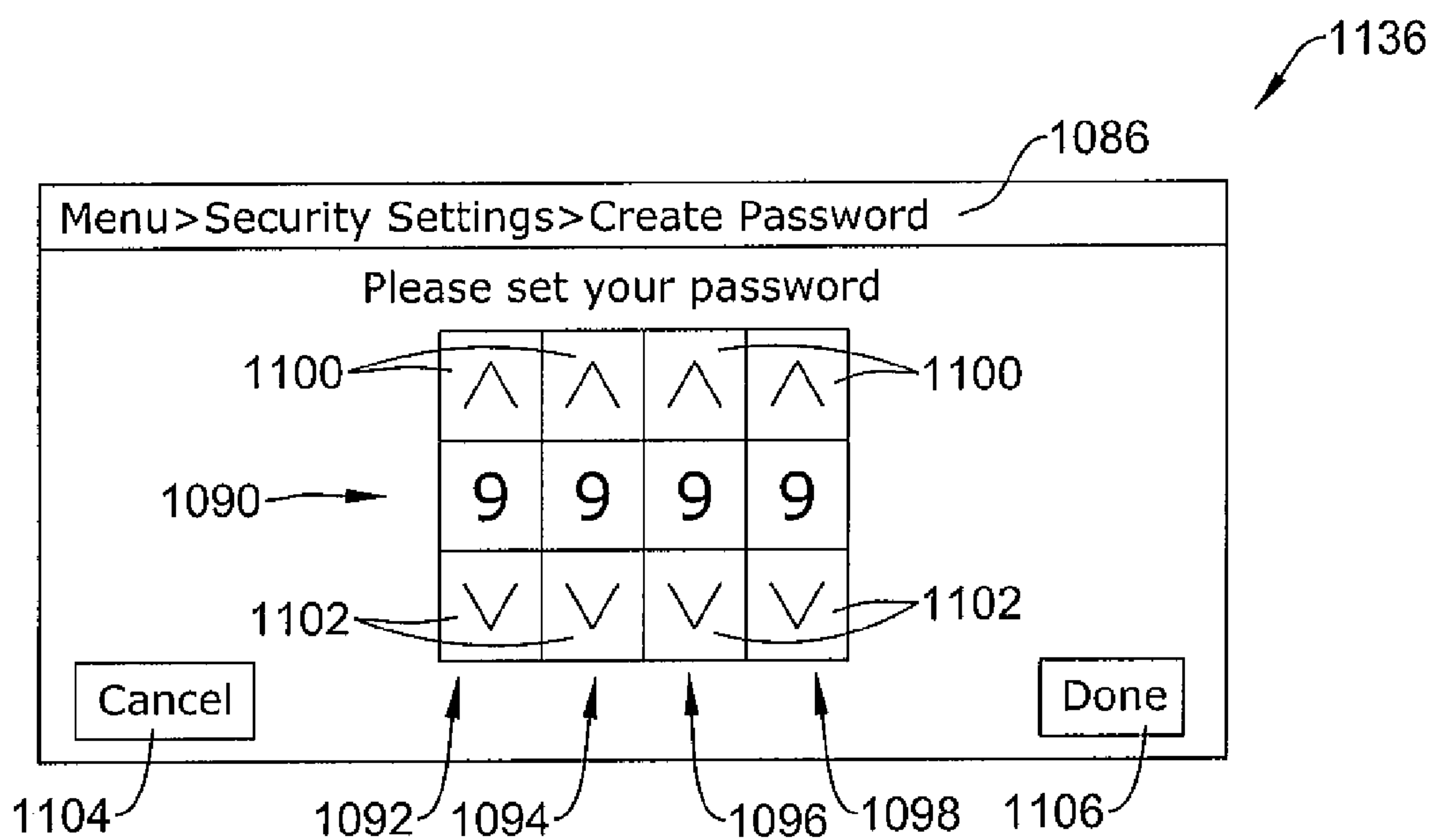


Figure 122

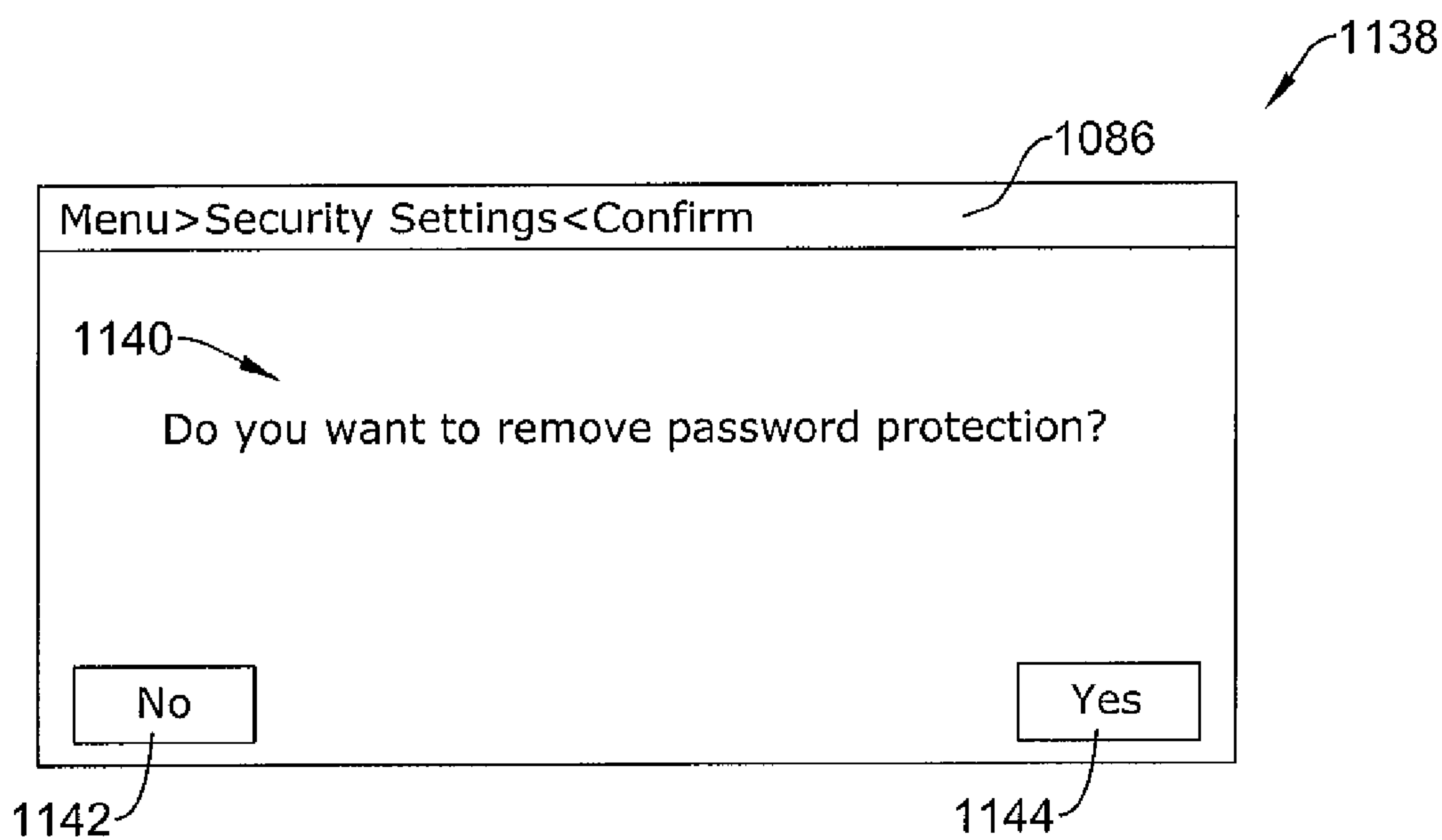
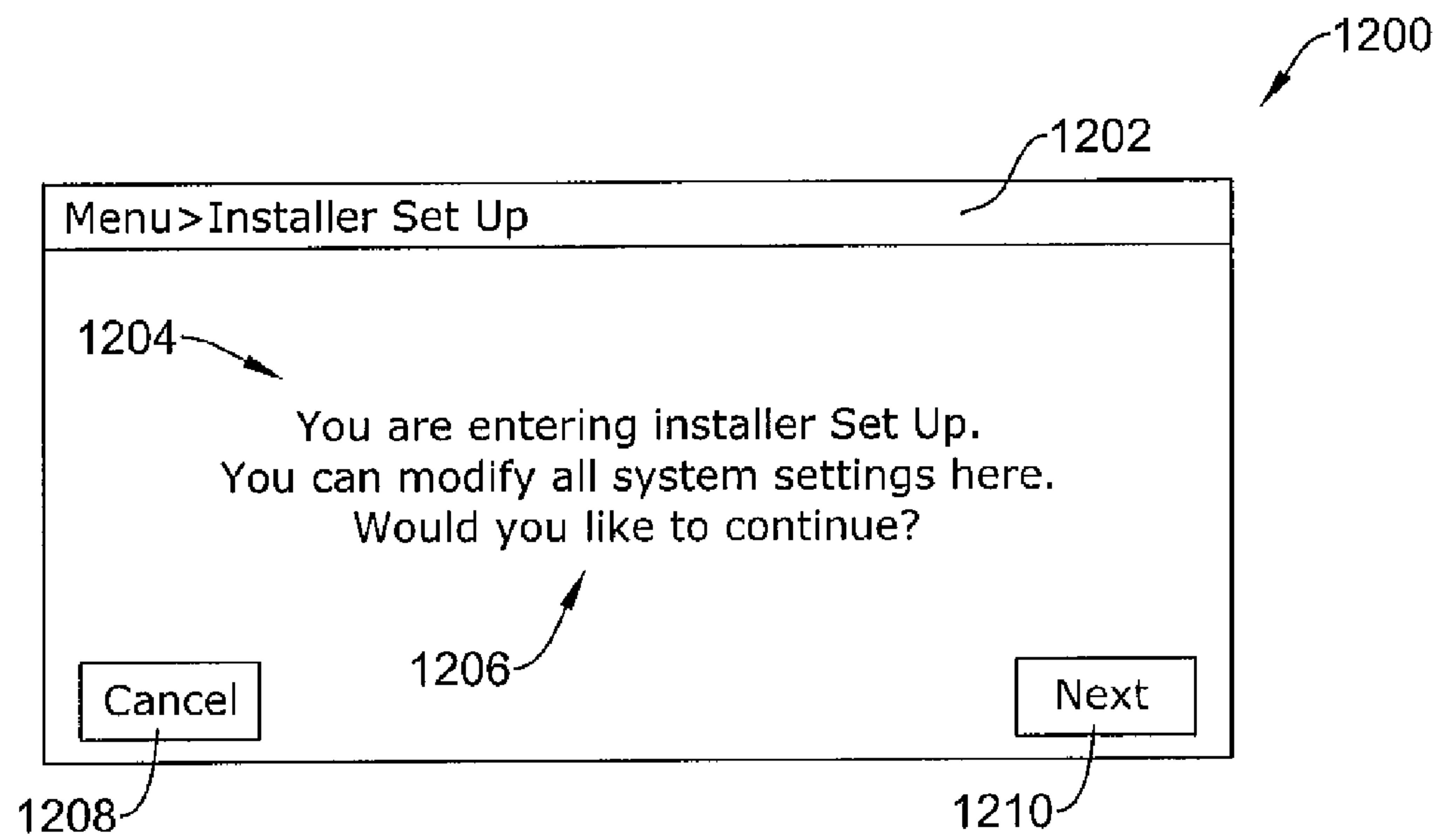
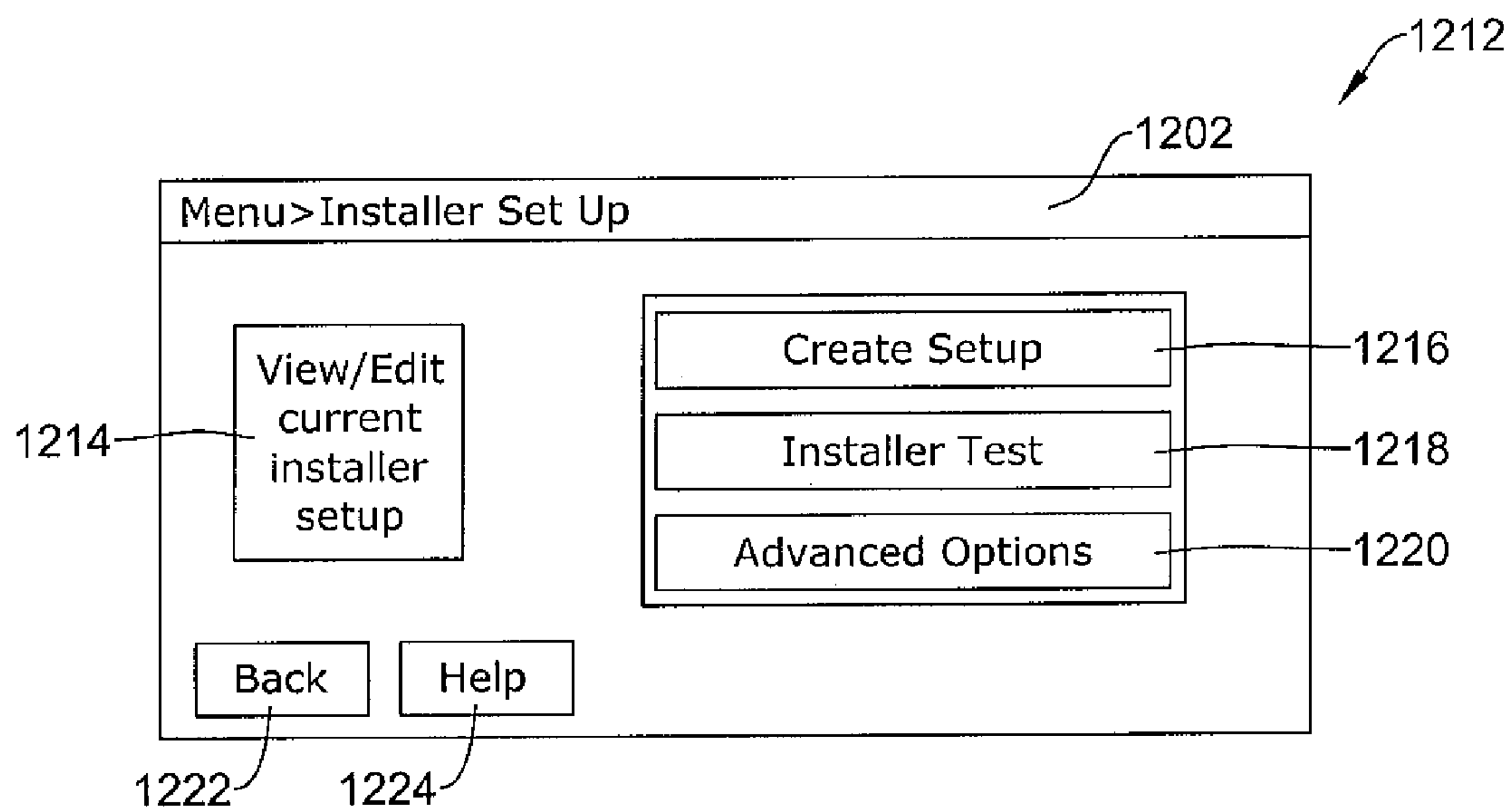
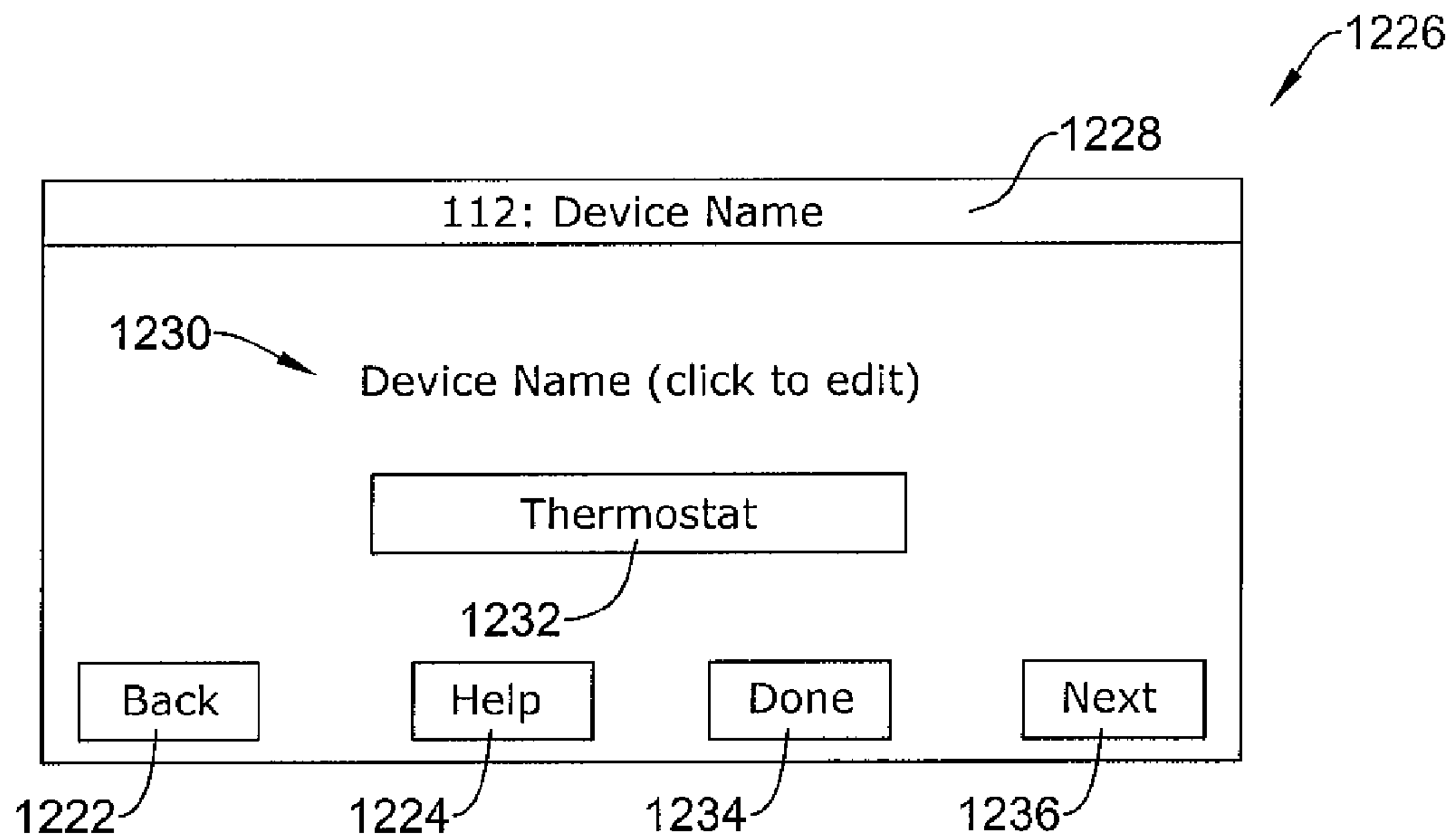
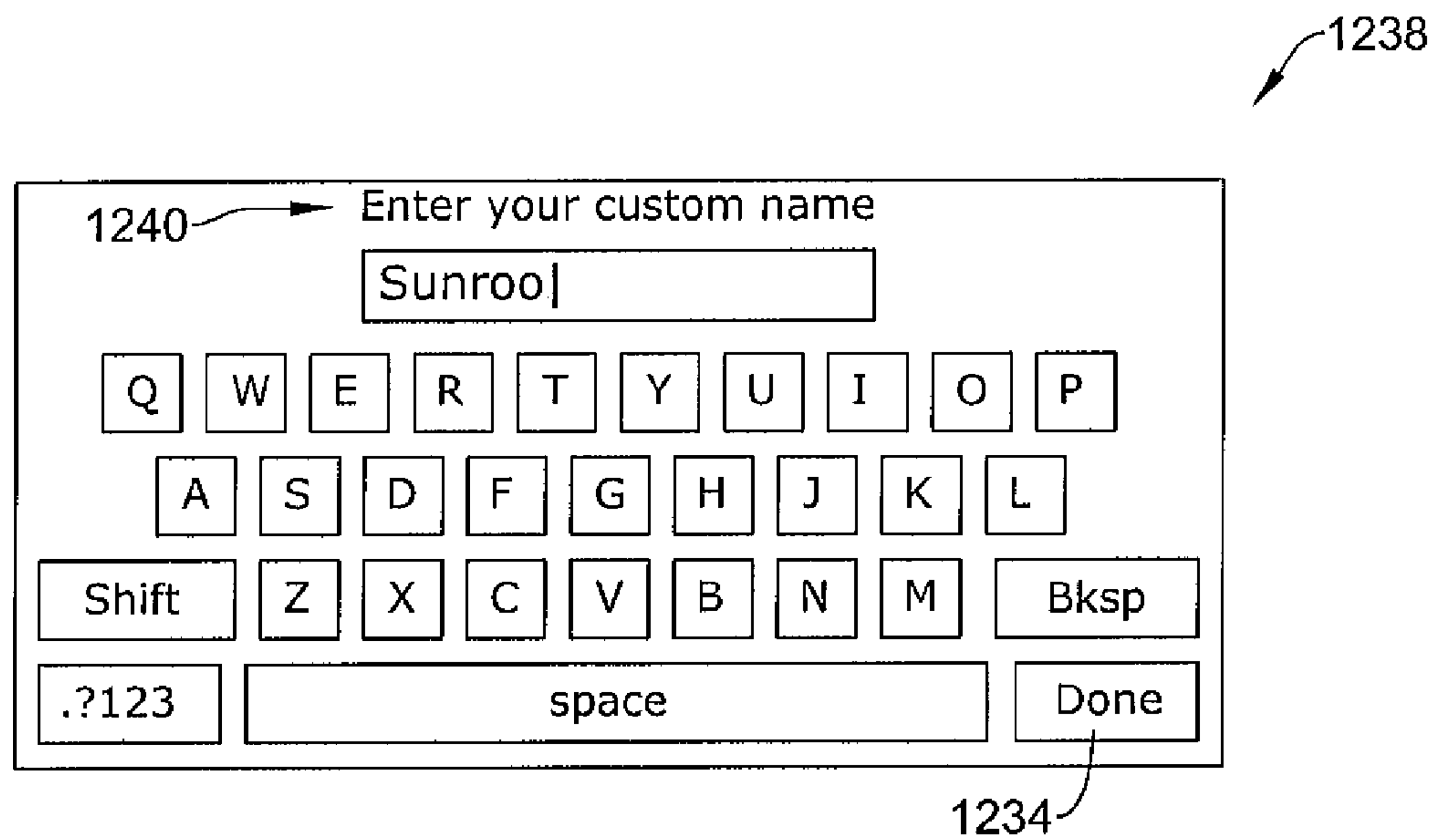
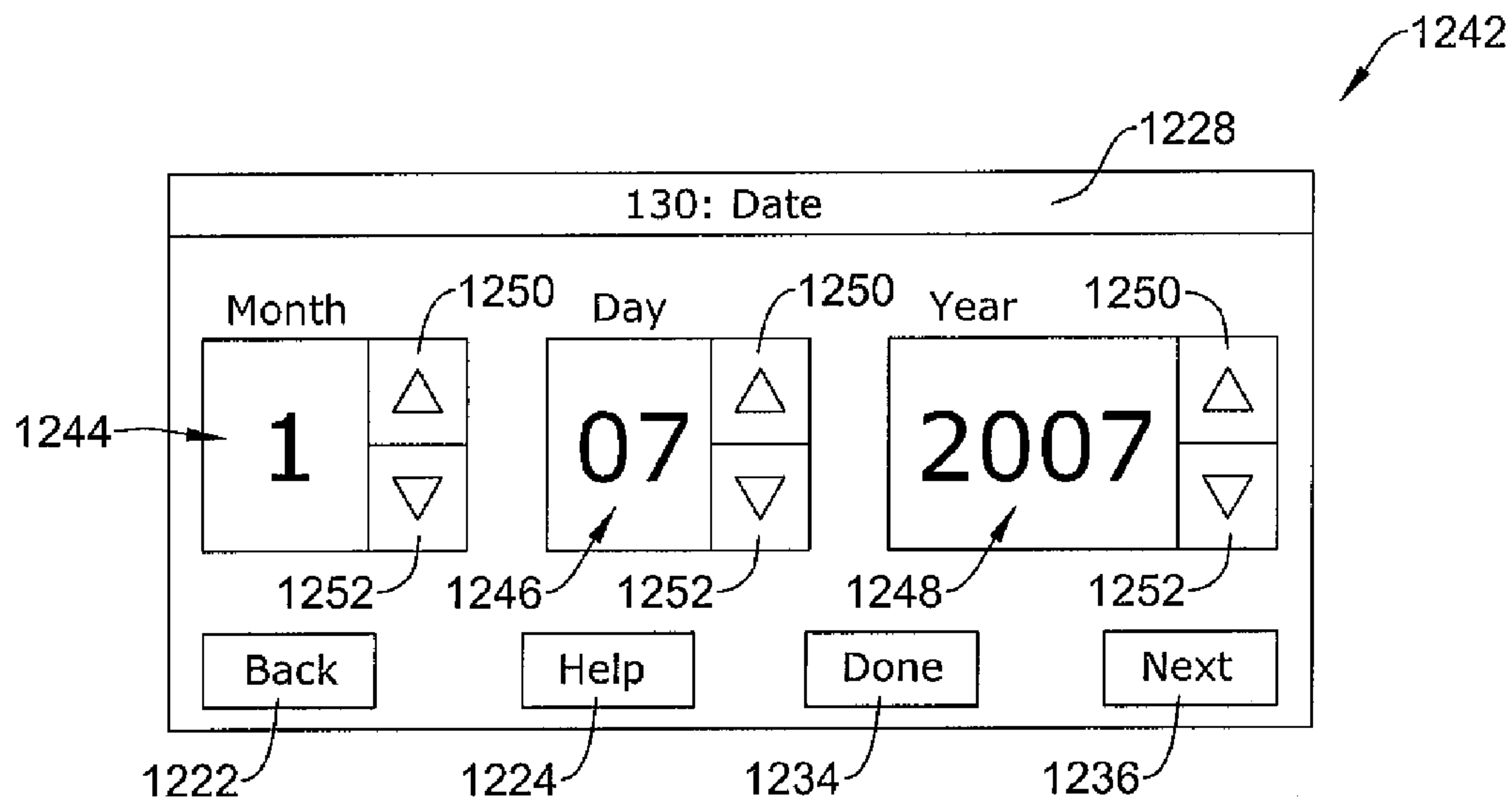
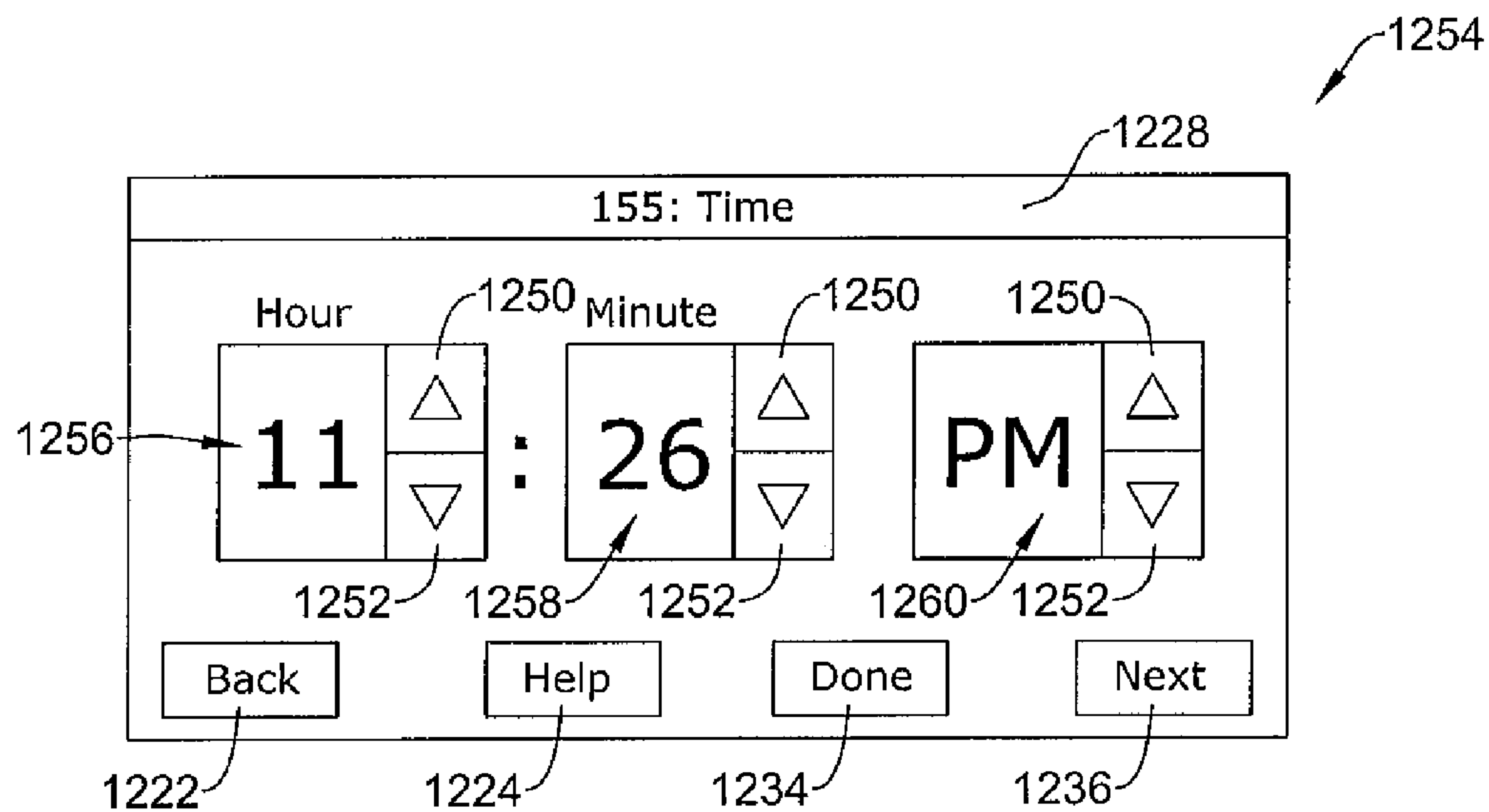


Figure 123

*Figure 124**Figure 125*

*Figure 126**Figure 127*

*Figure 128**Figure 129*

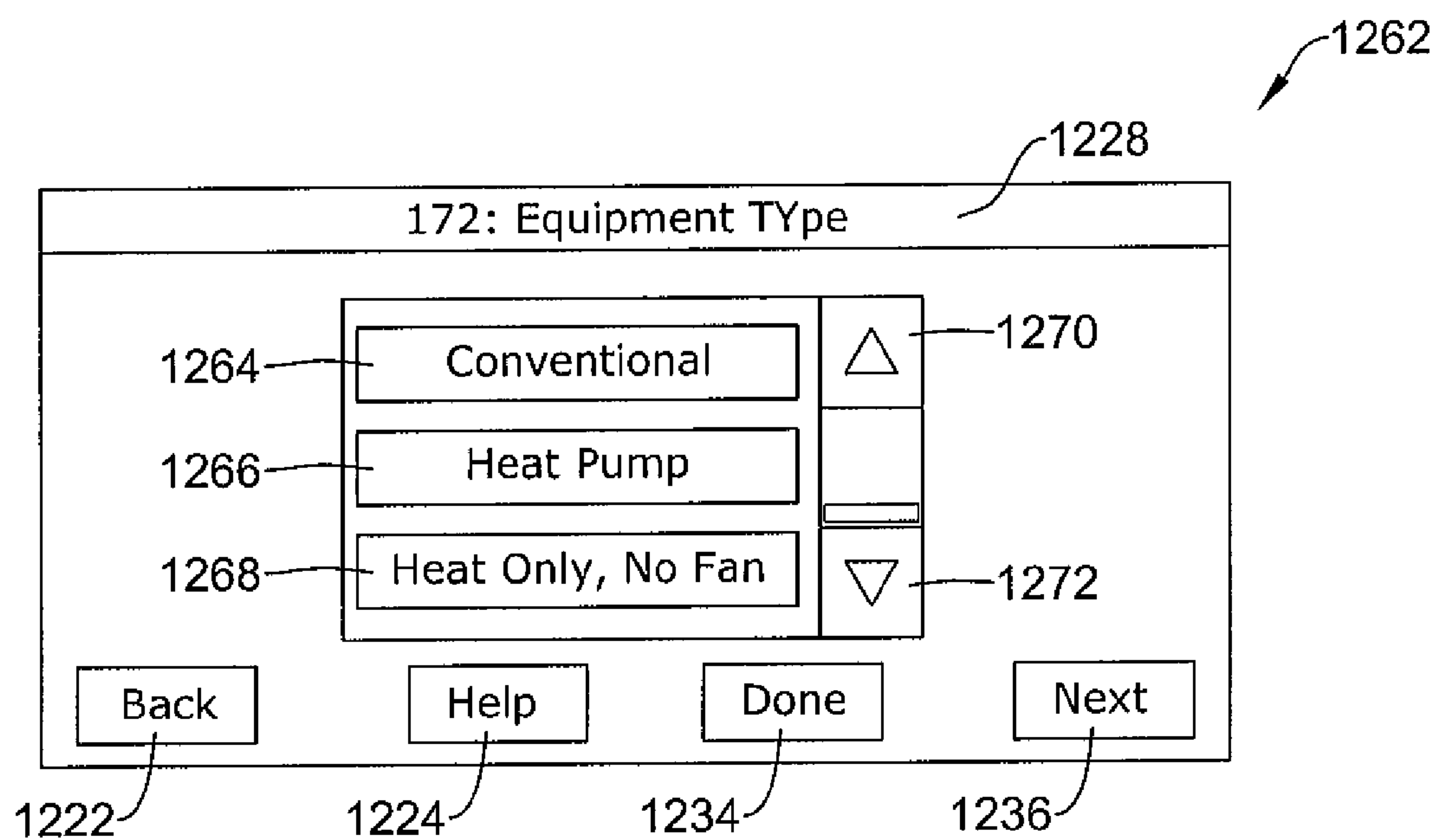


Figure 130

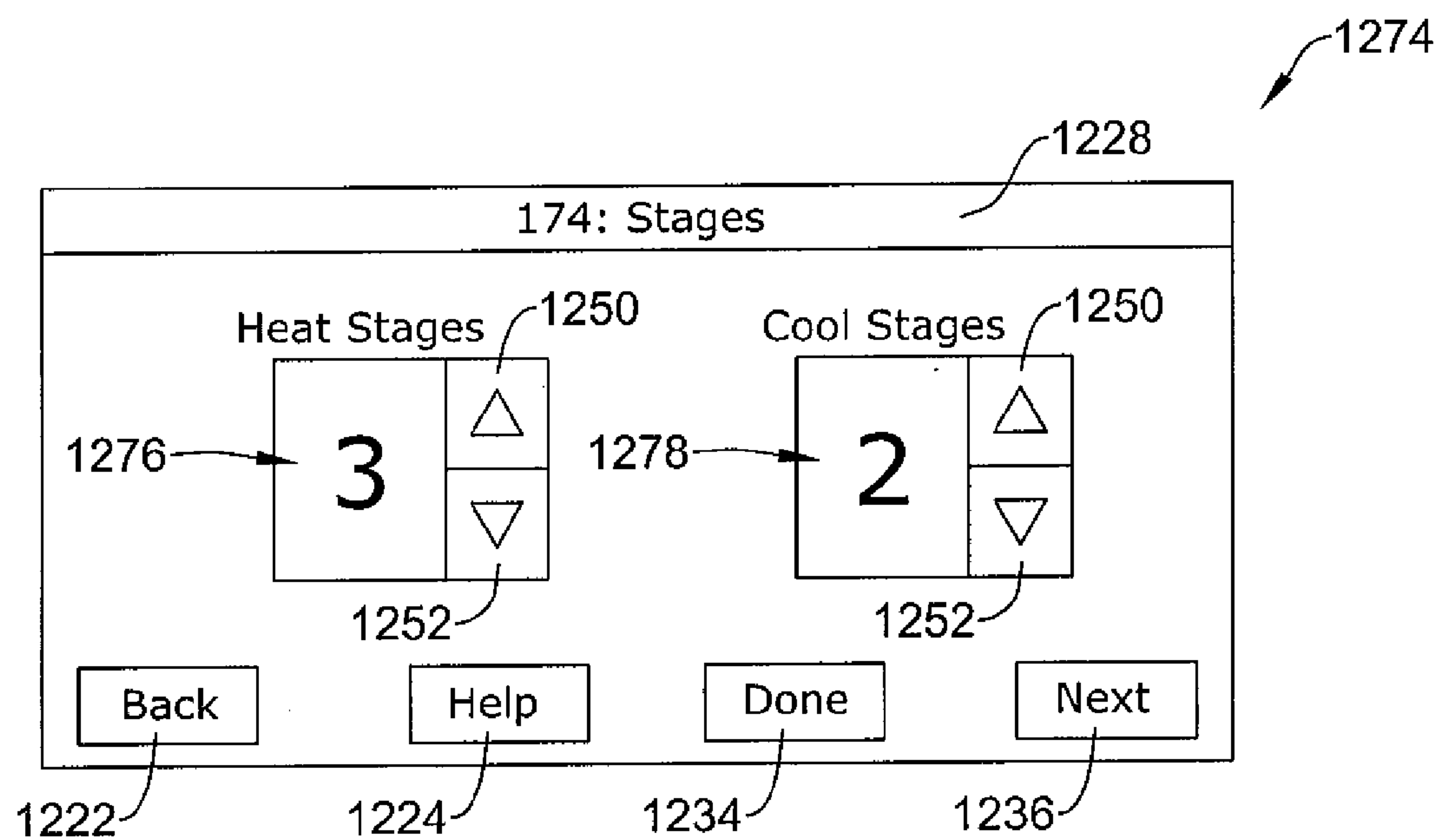


Figure 131

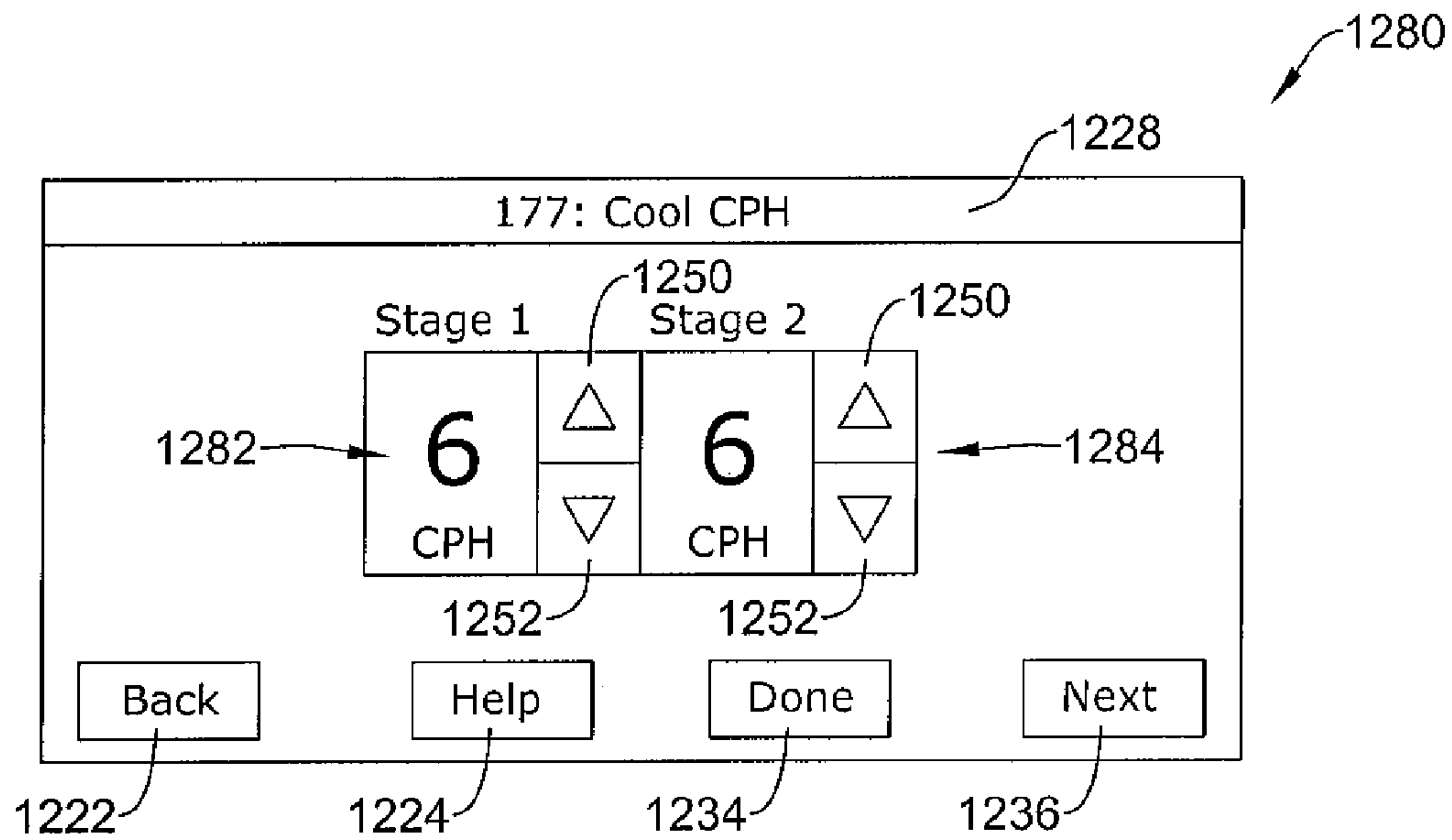


Figure 132

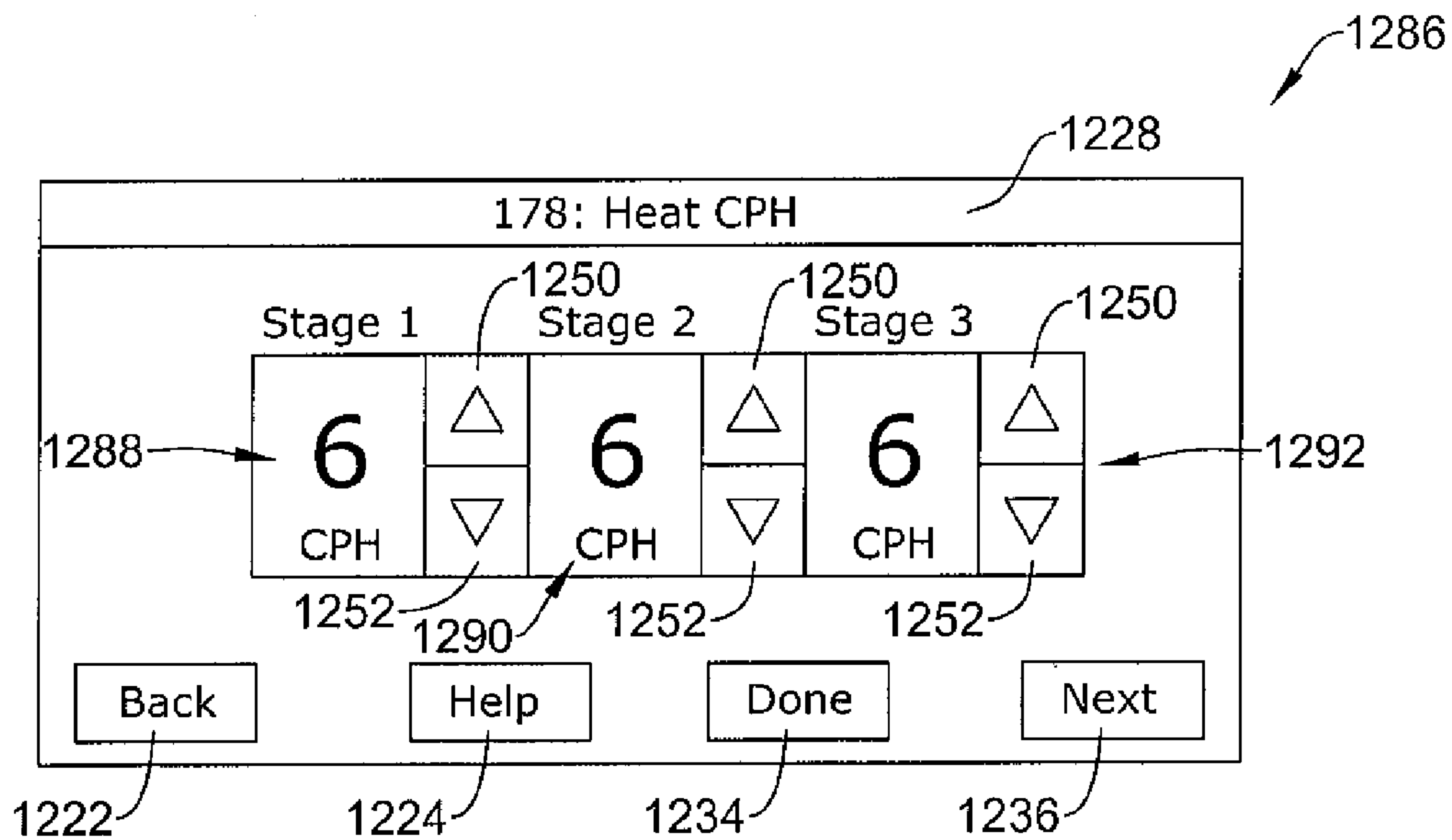


Figure 133

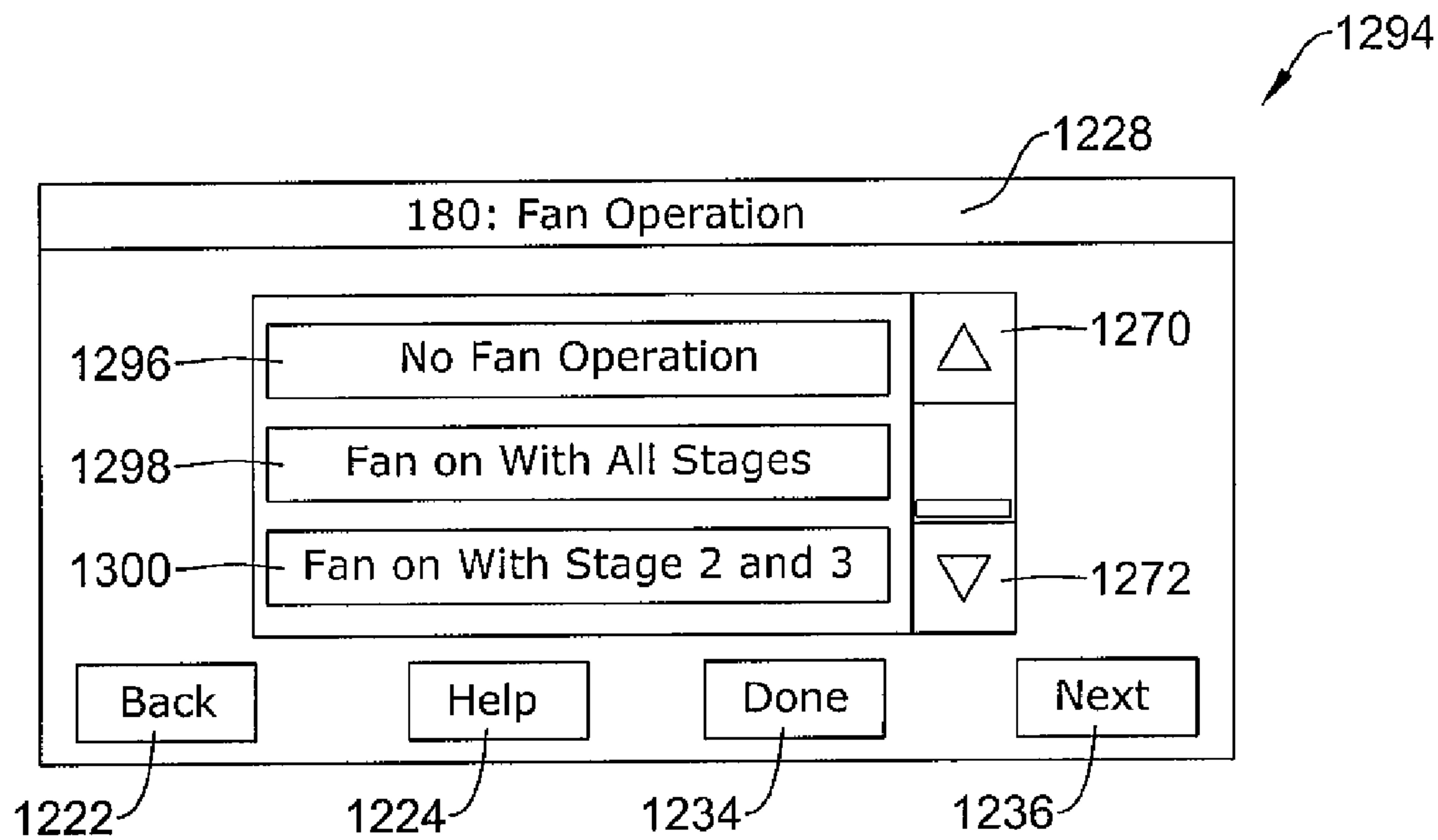


Figure 134

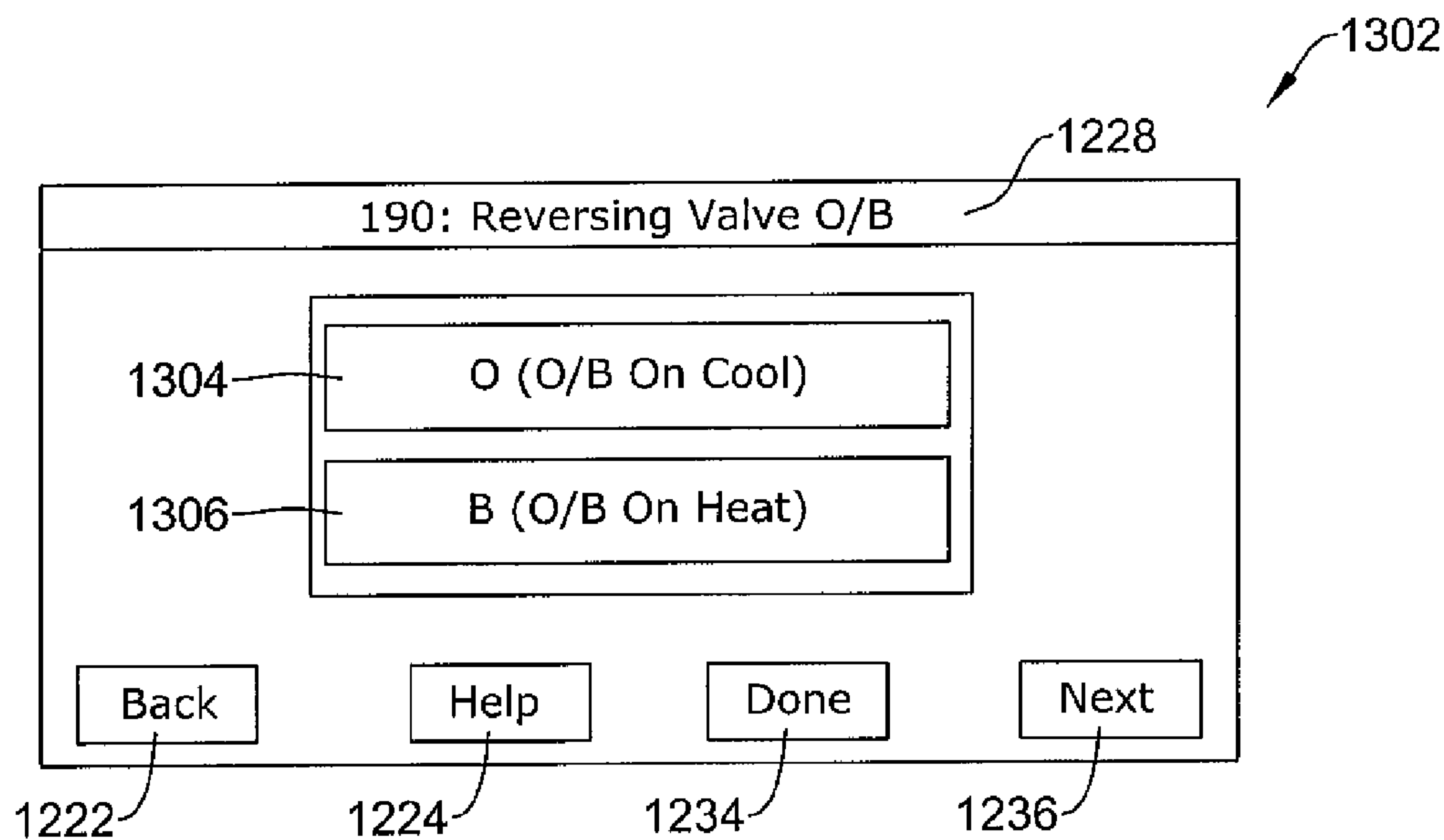


Figure 135

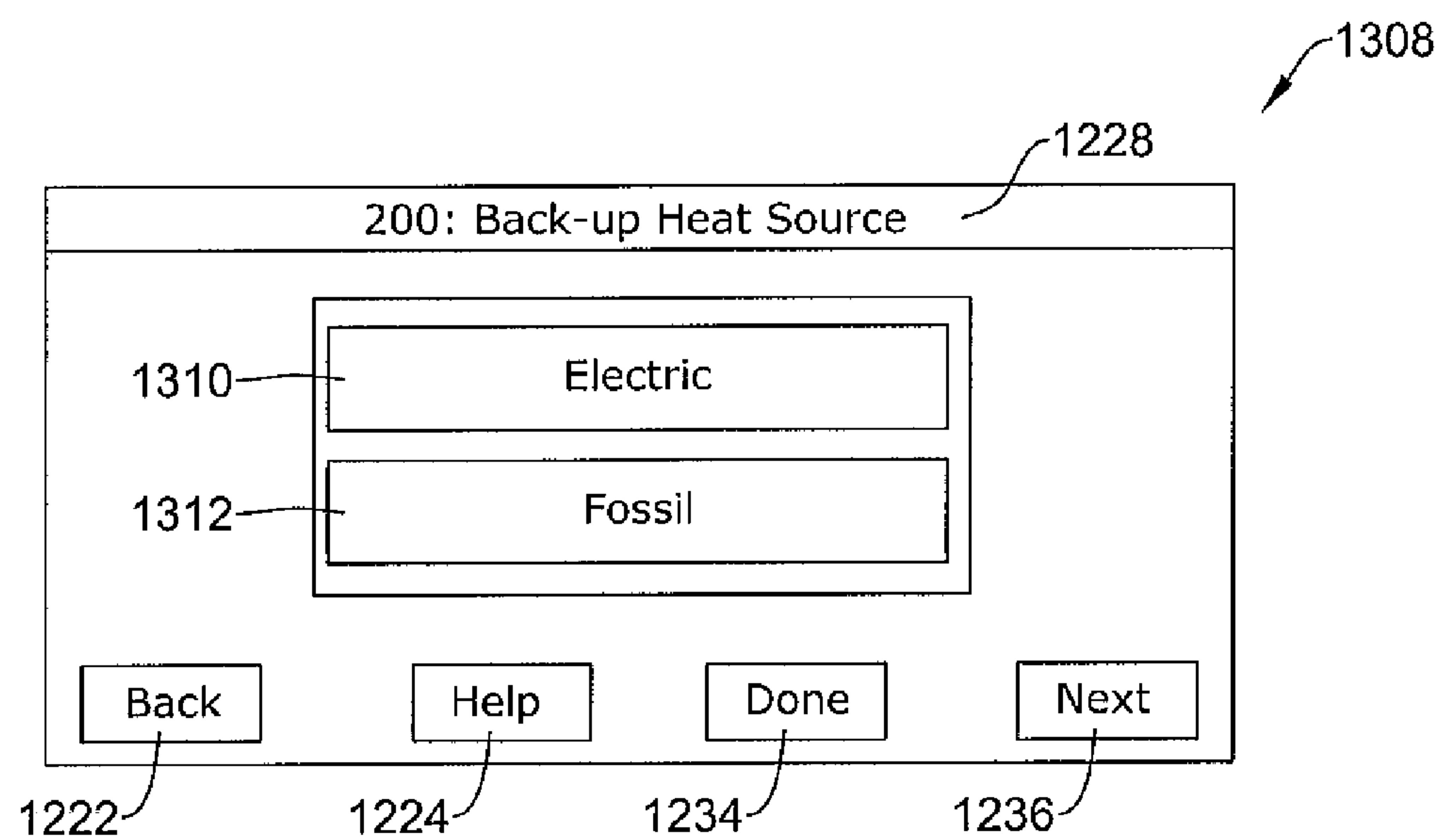


Figure 136

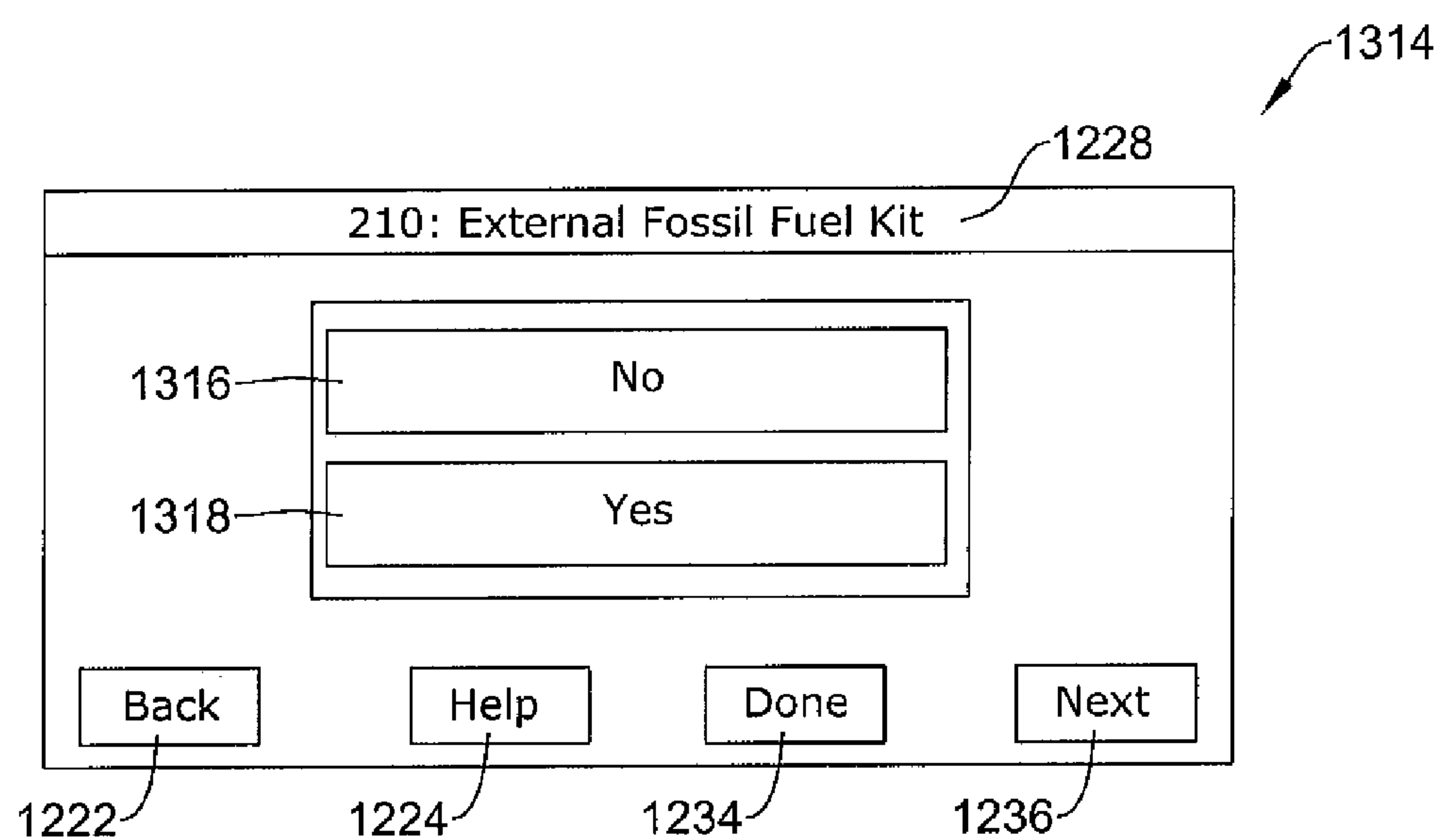
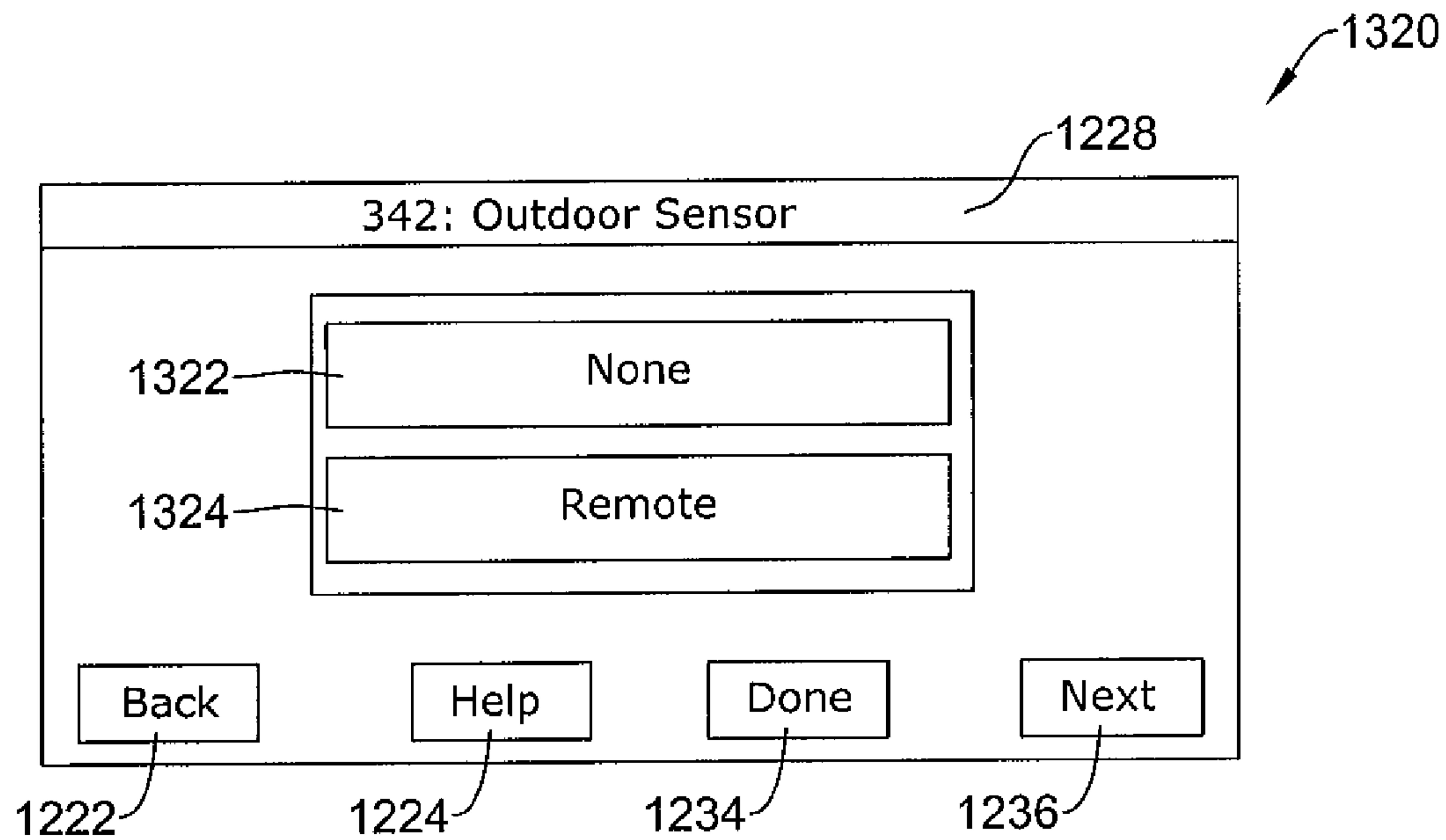
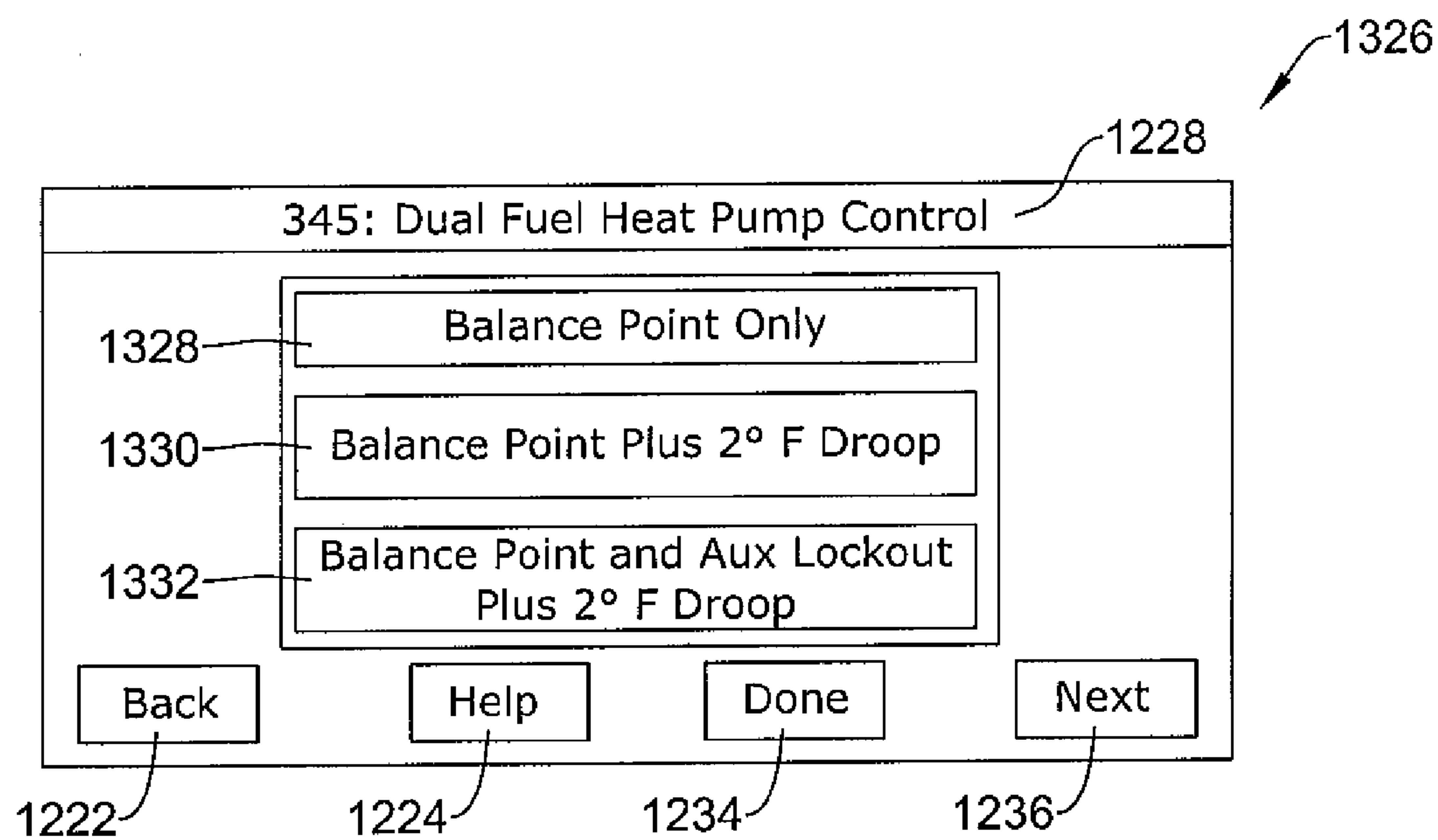


Figure 137

*Figure 138**Figure 139*

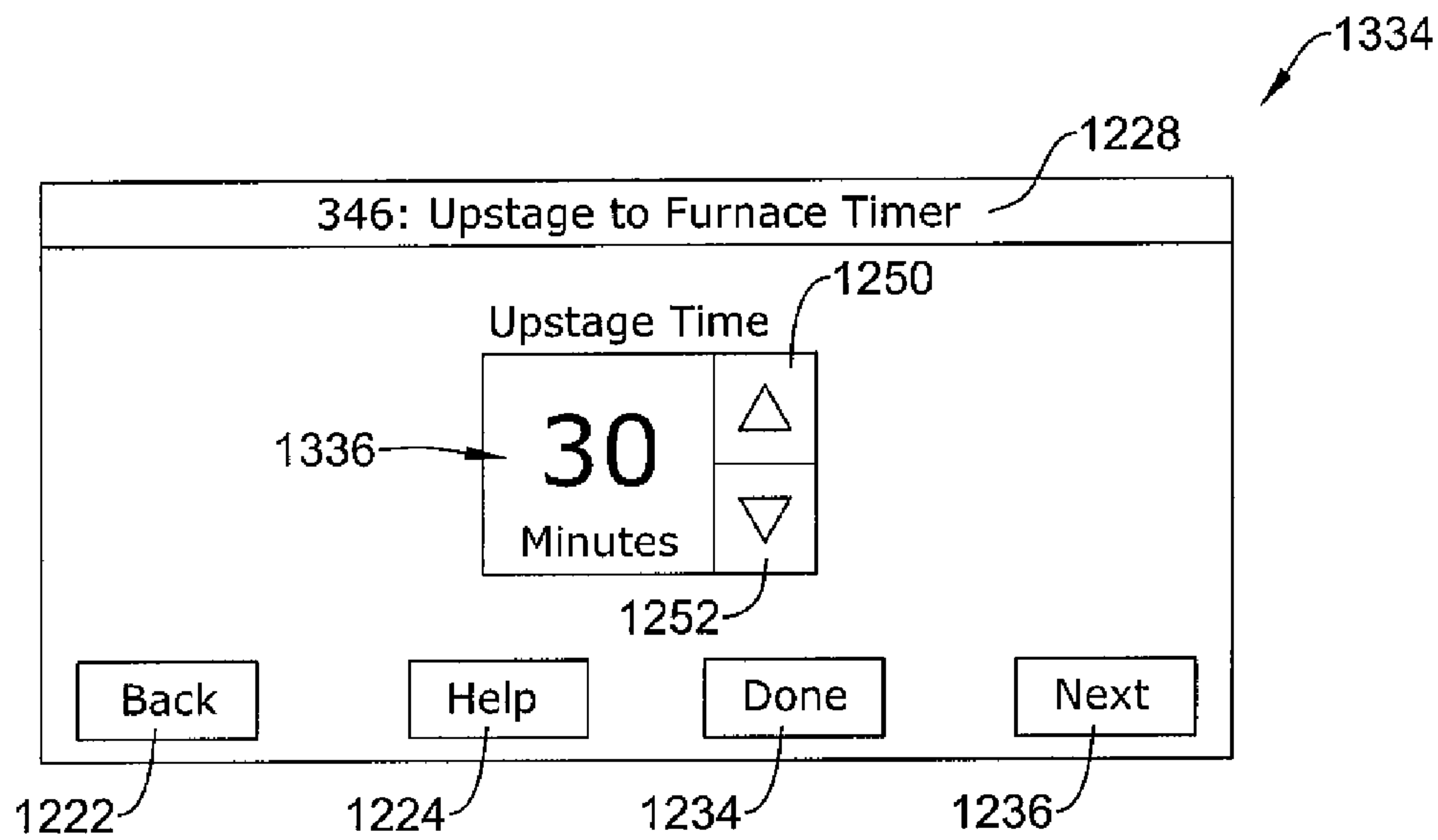


Figure 140

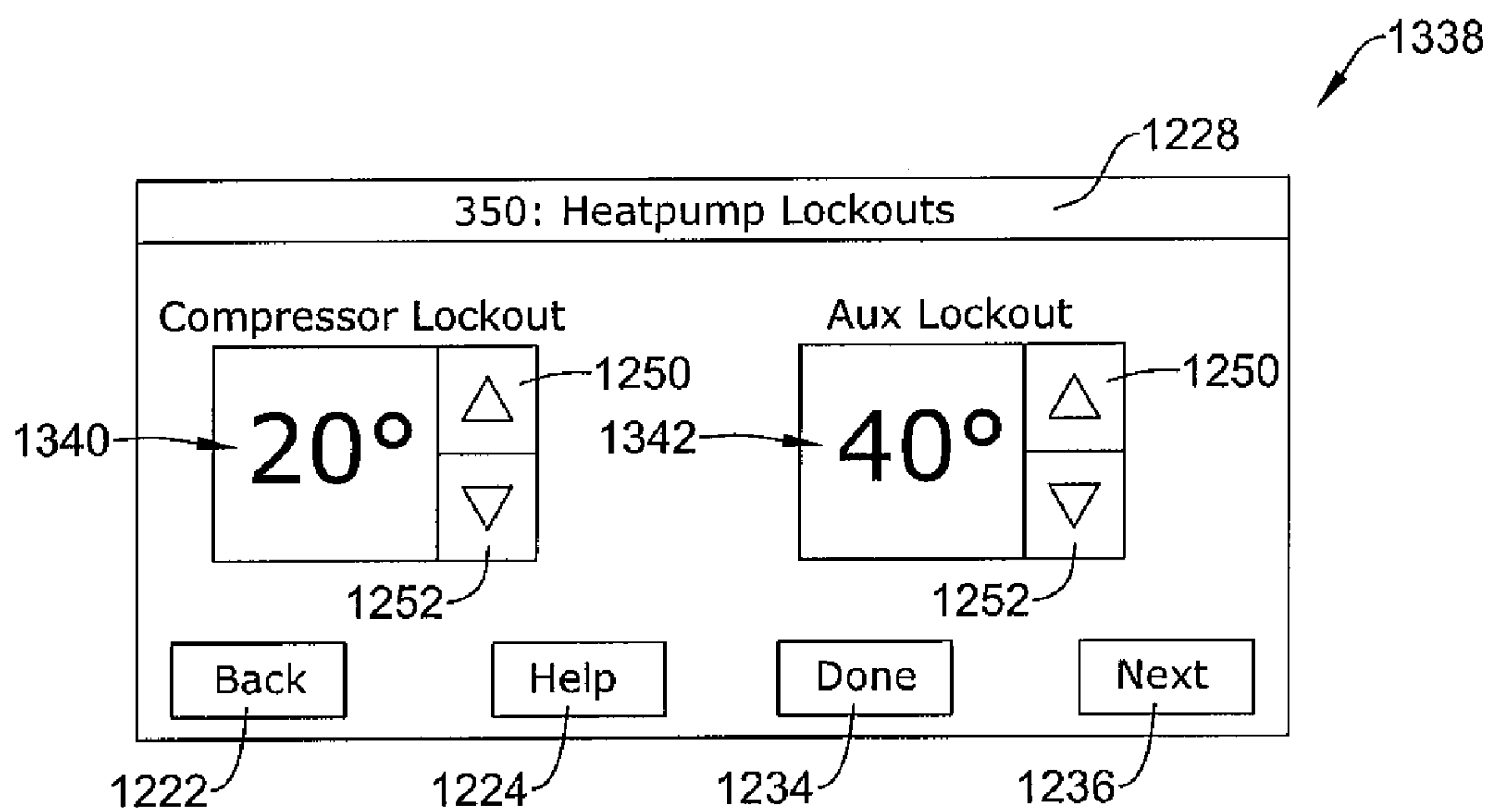
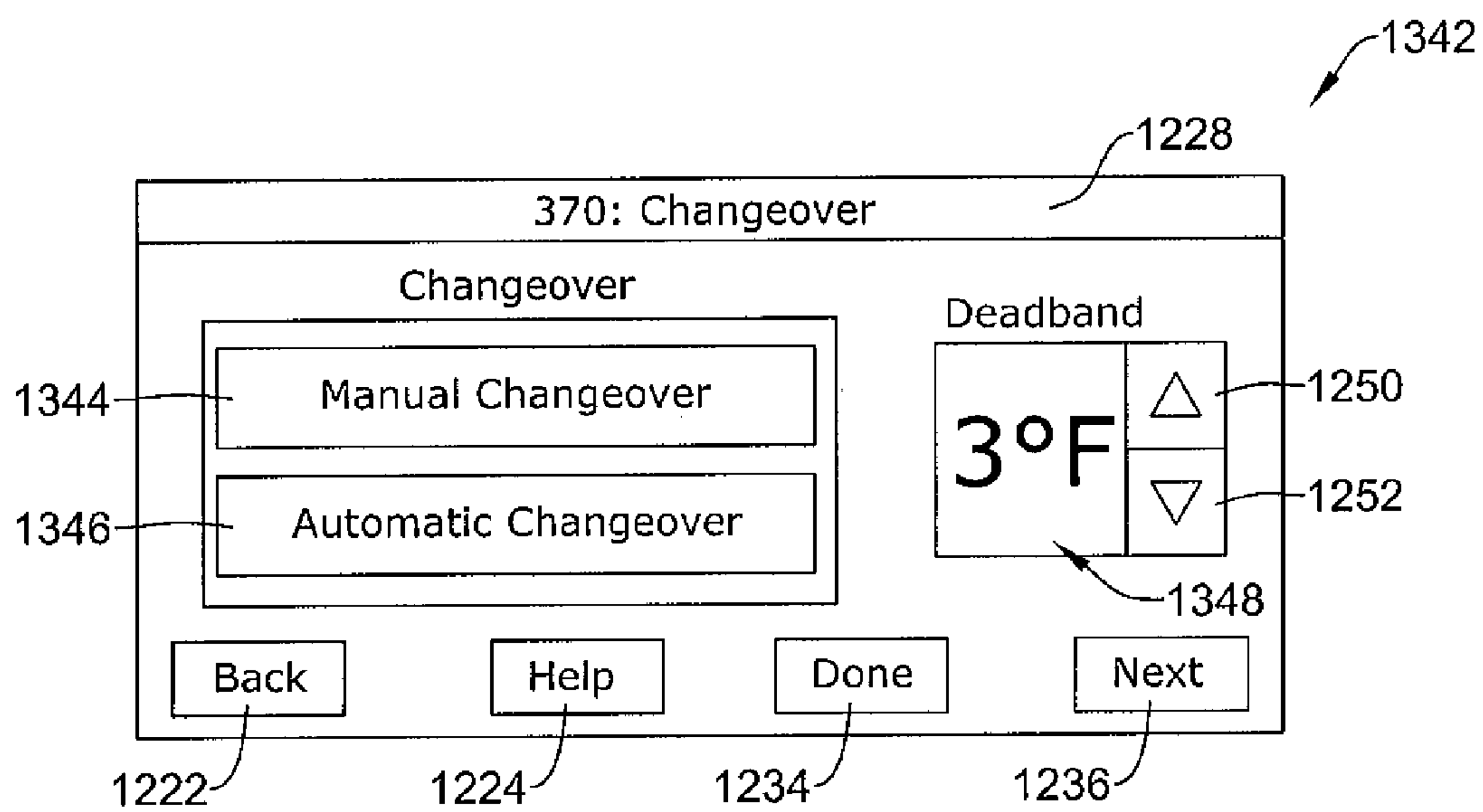
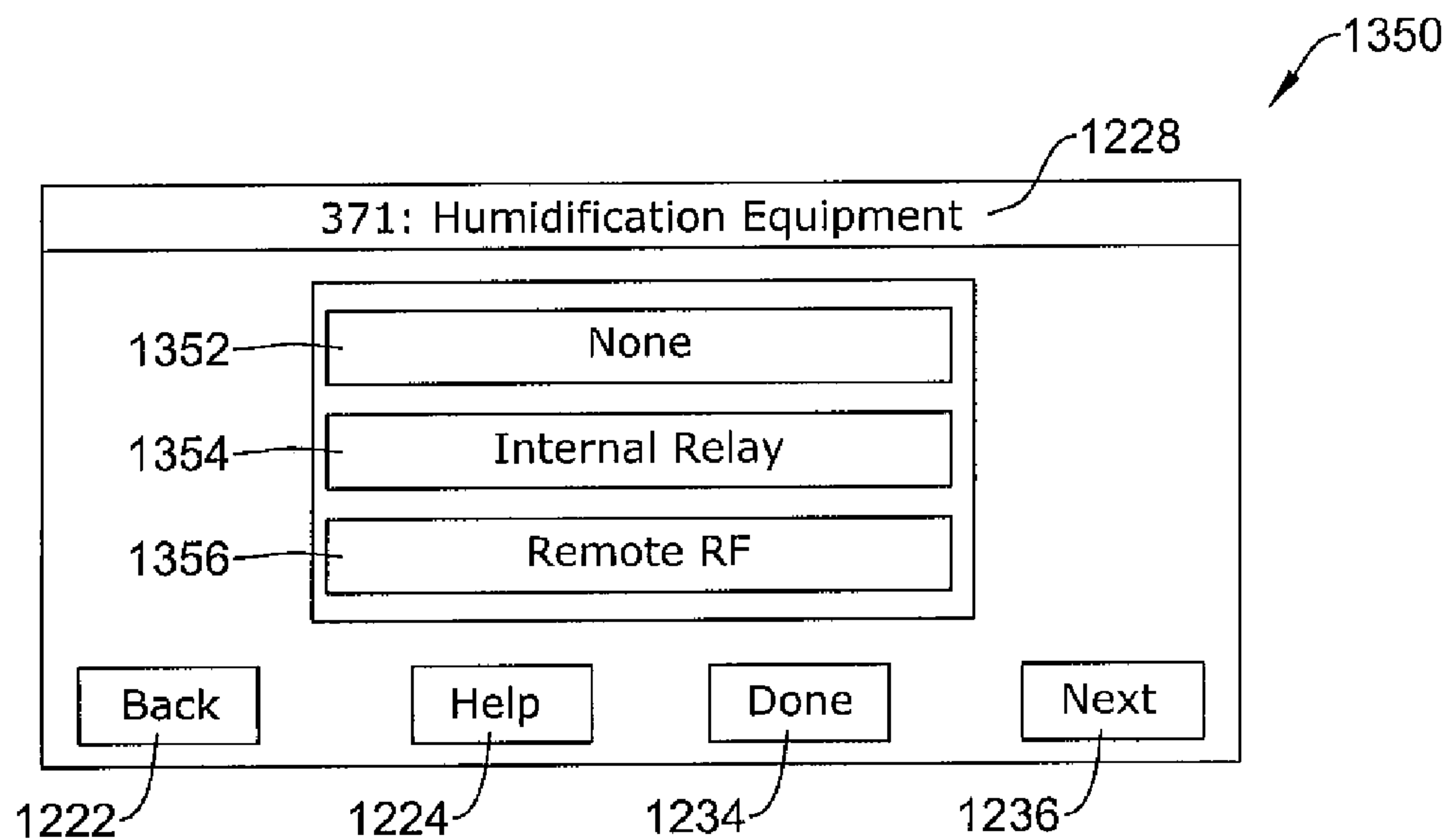


Figure 141

*Figure 142**Figure 143*

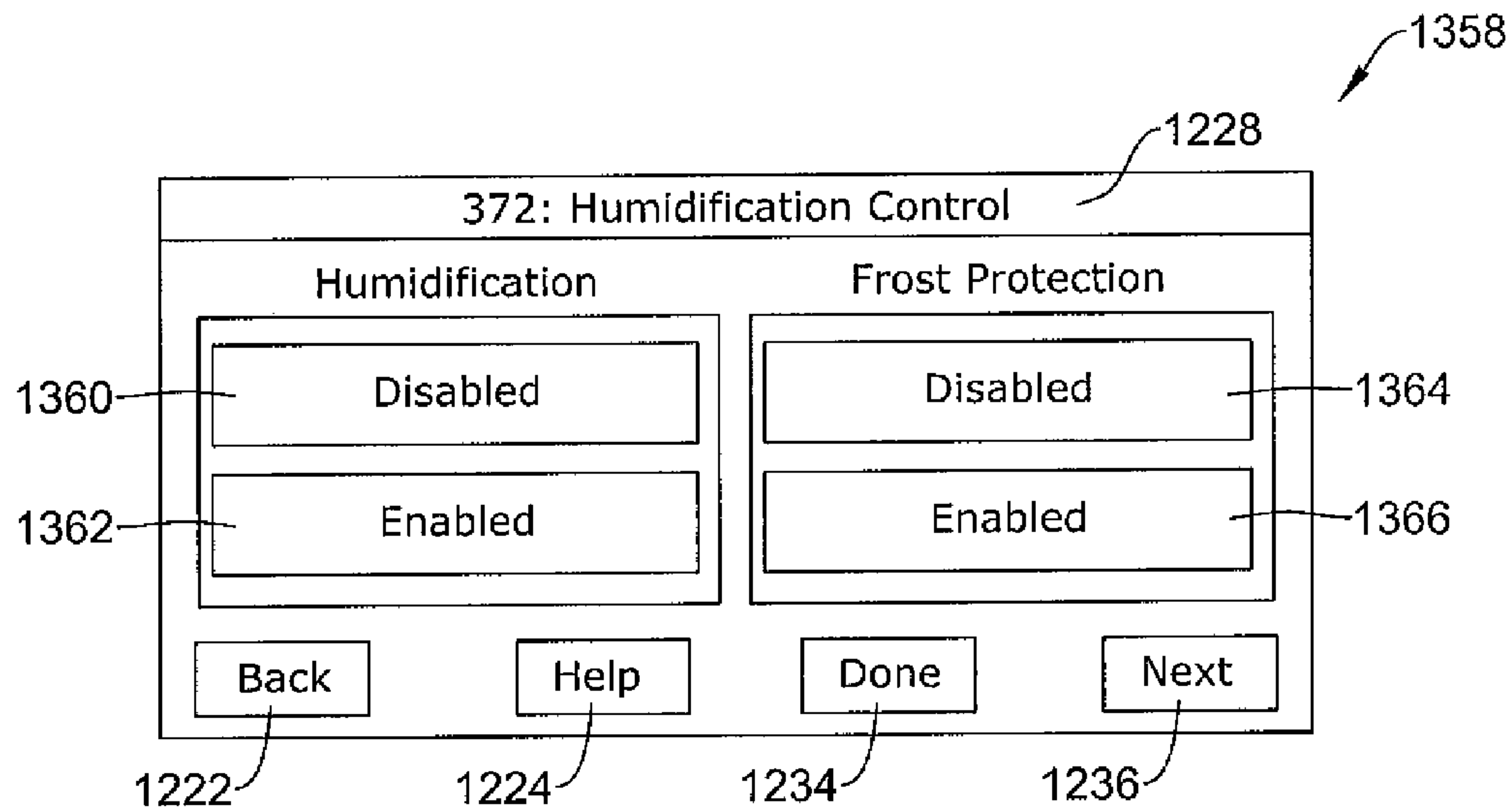


Figure 144

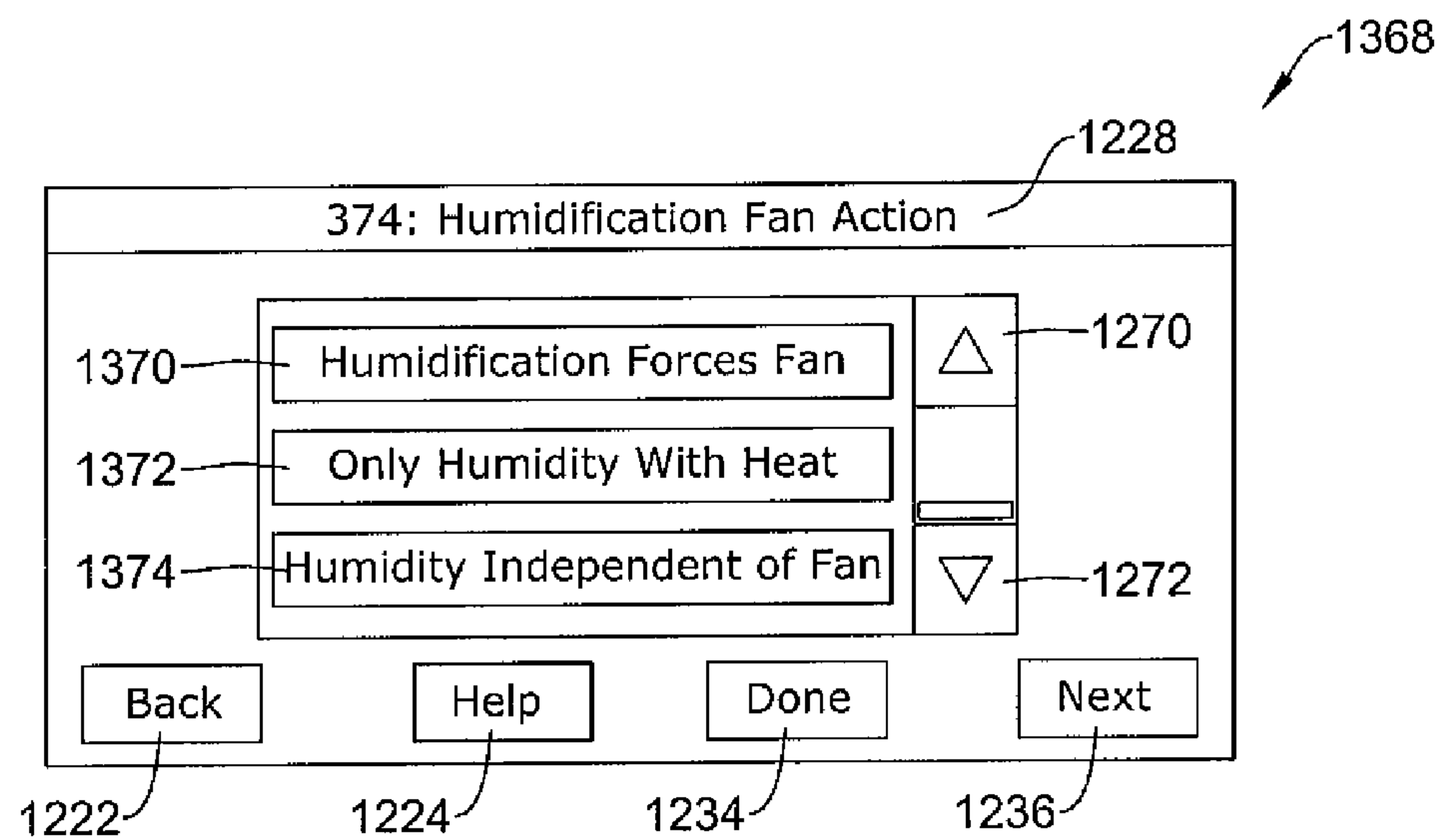


Figure 145

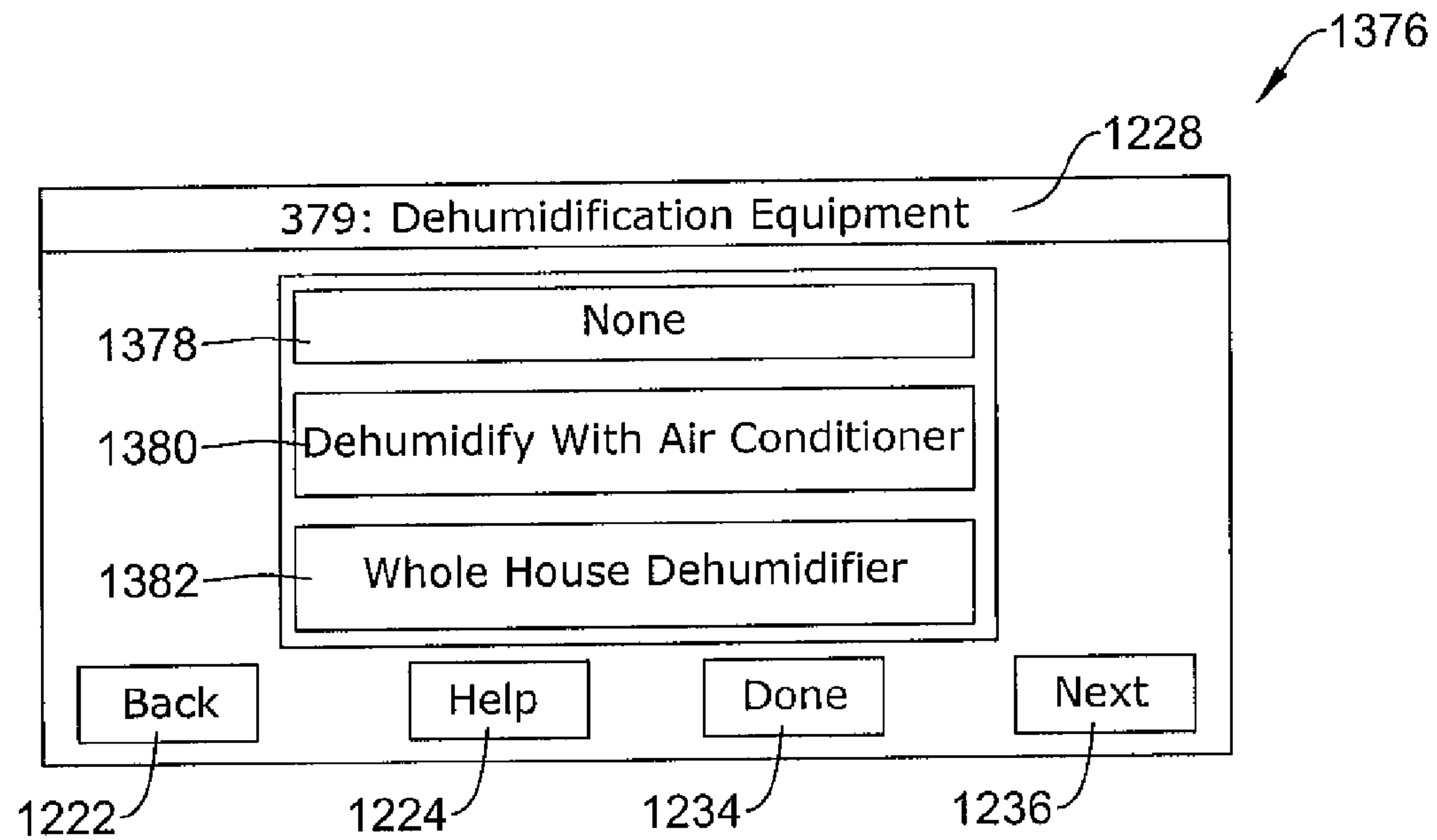


Figure 146

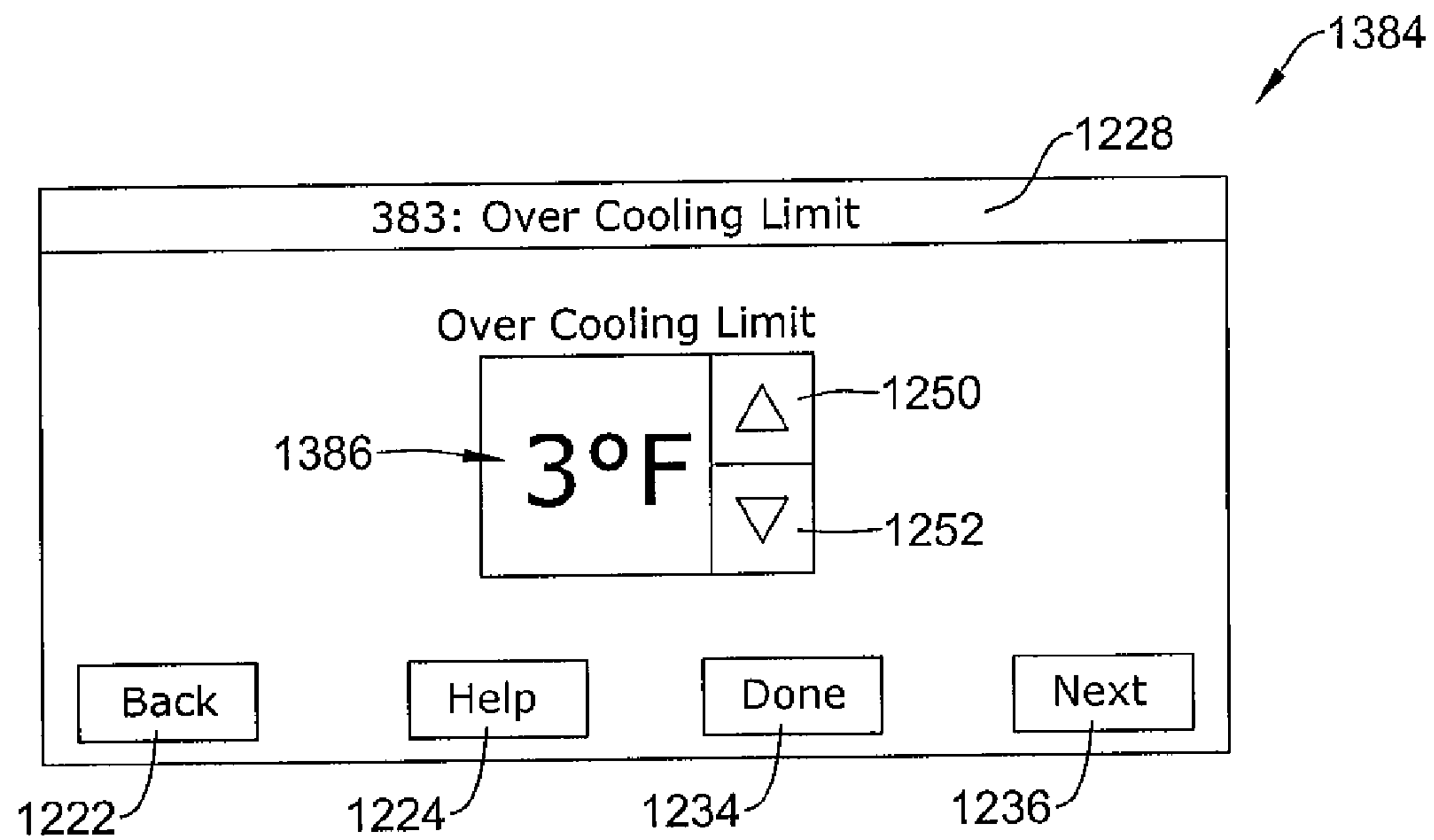
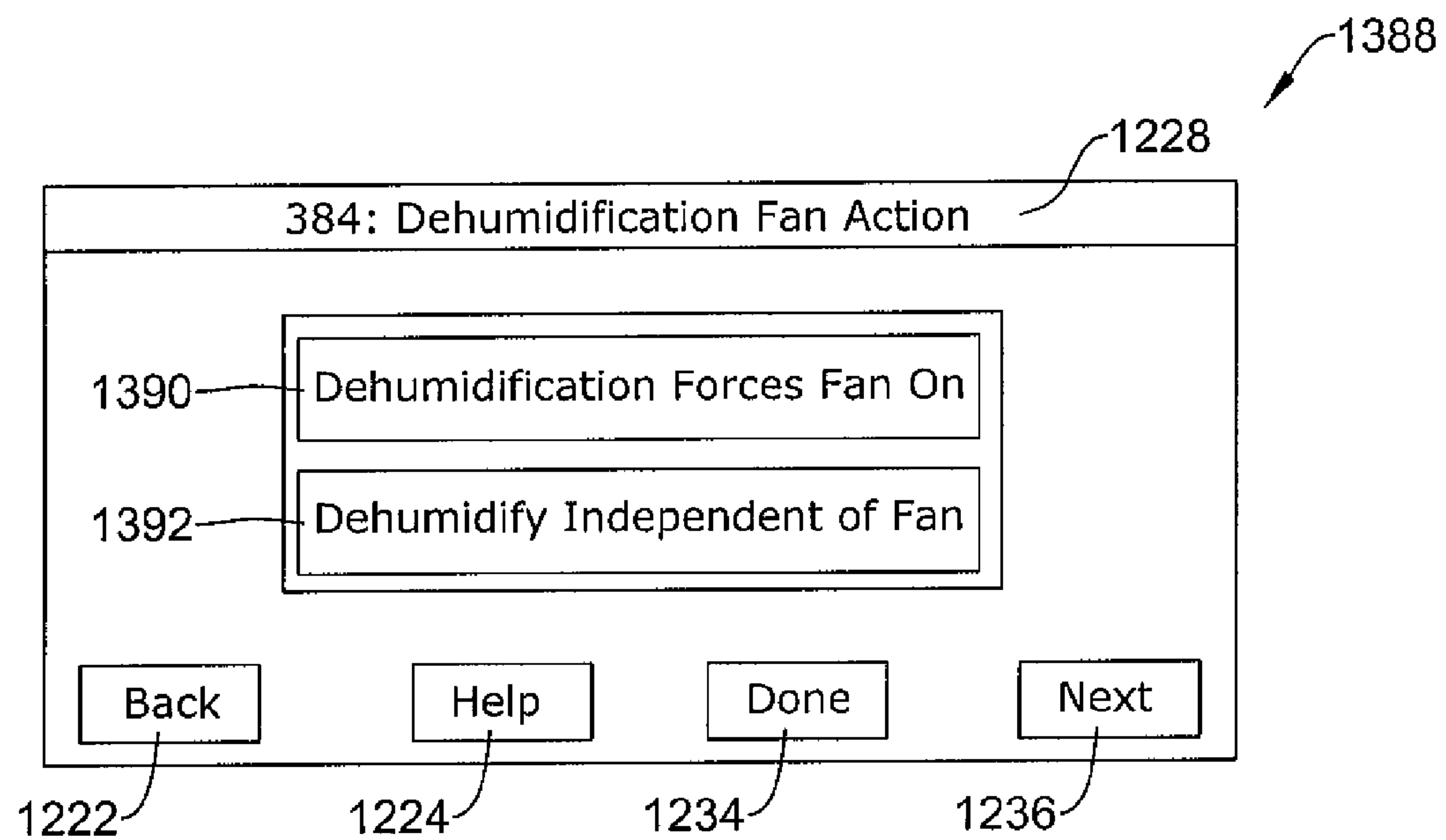
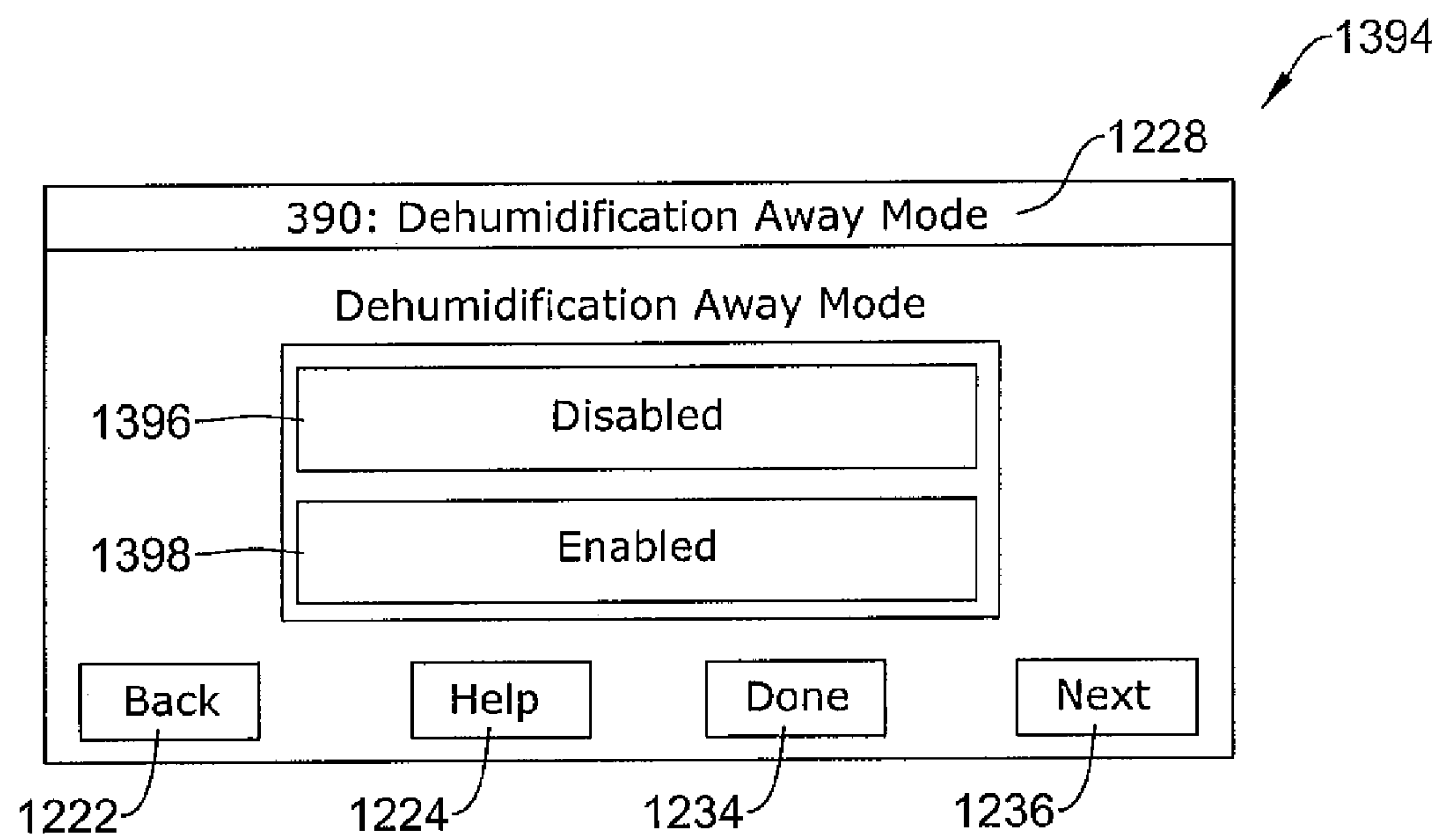
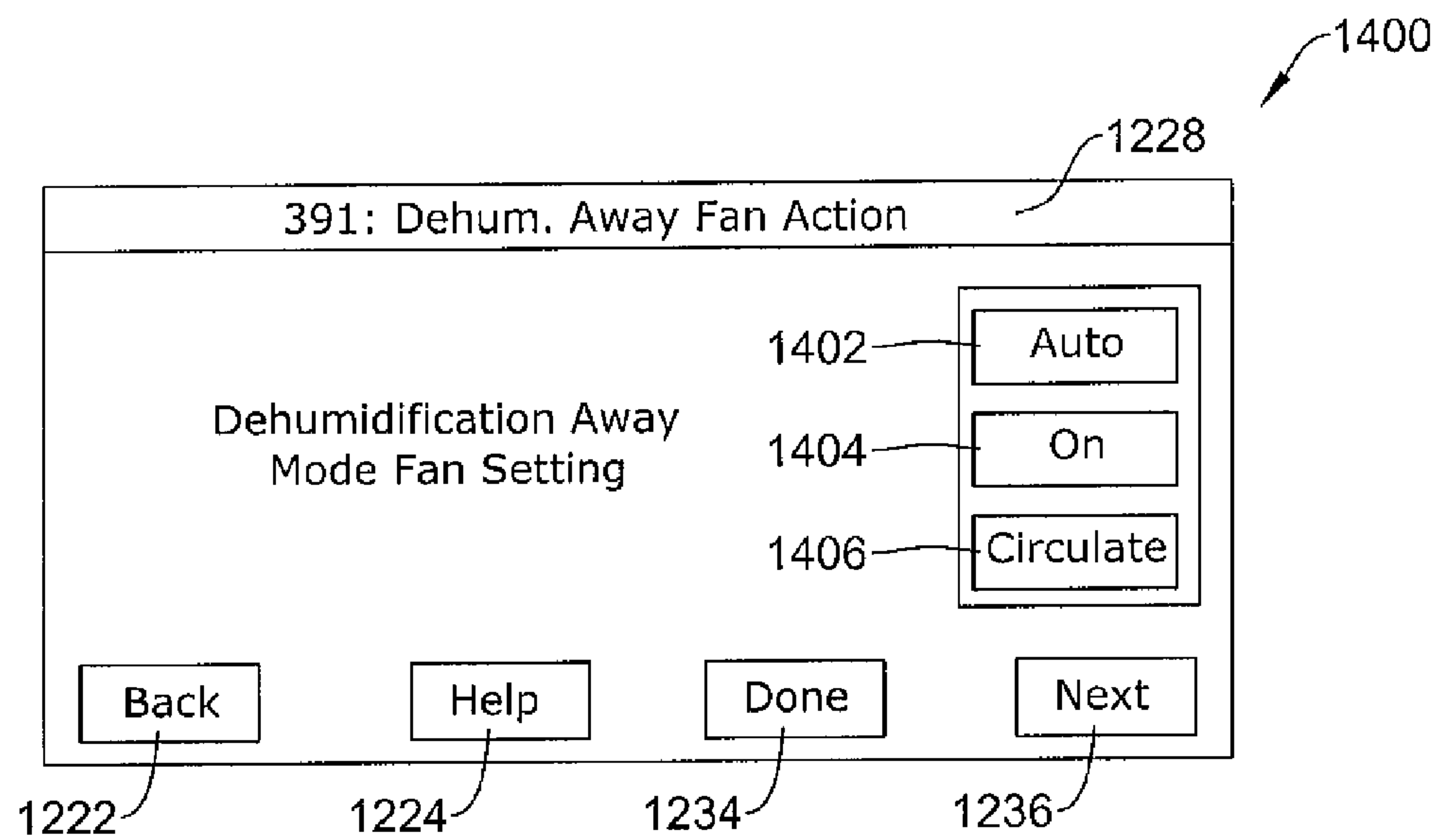
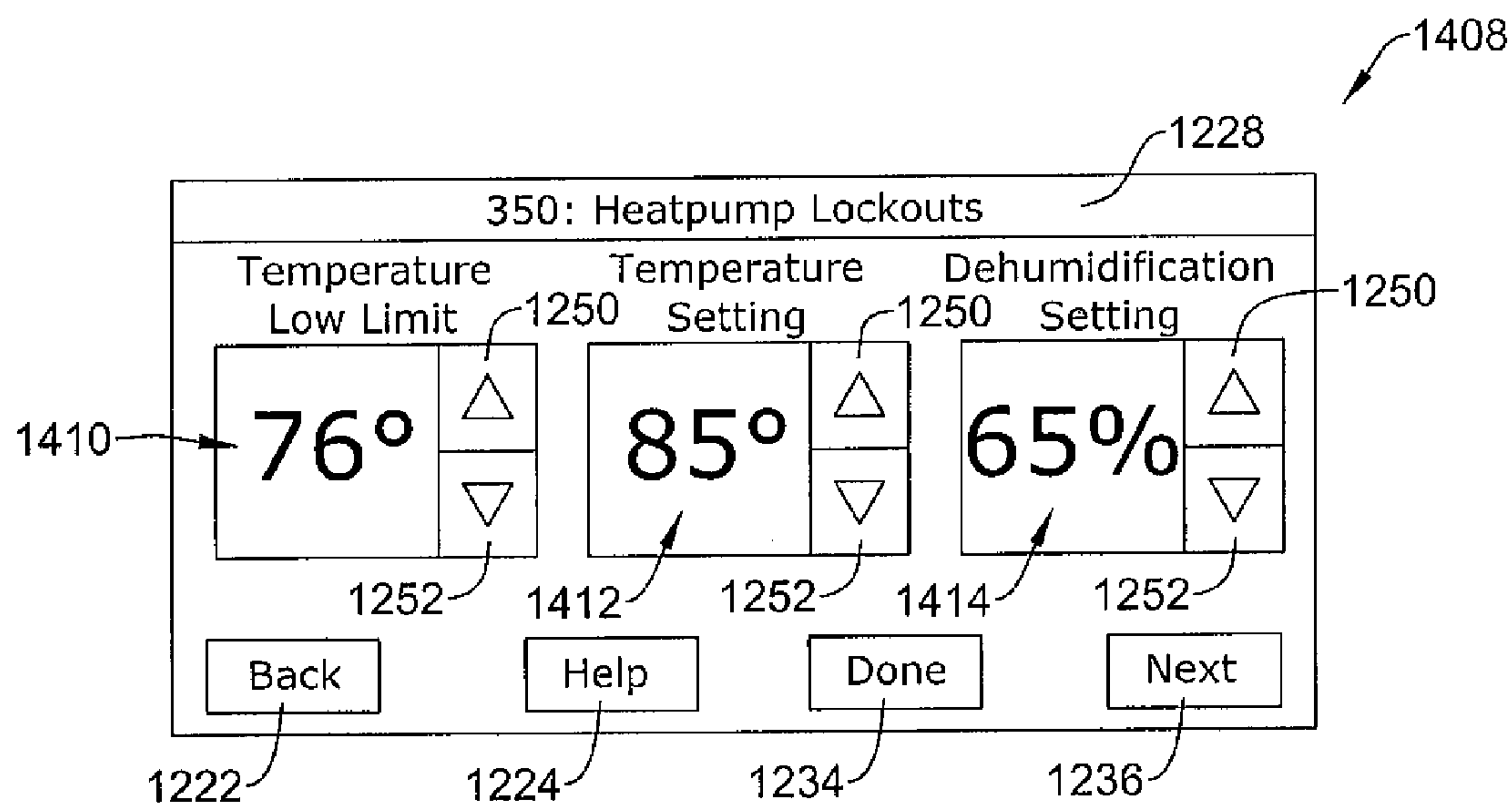
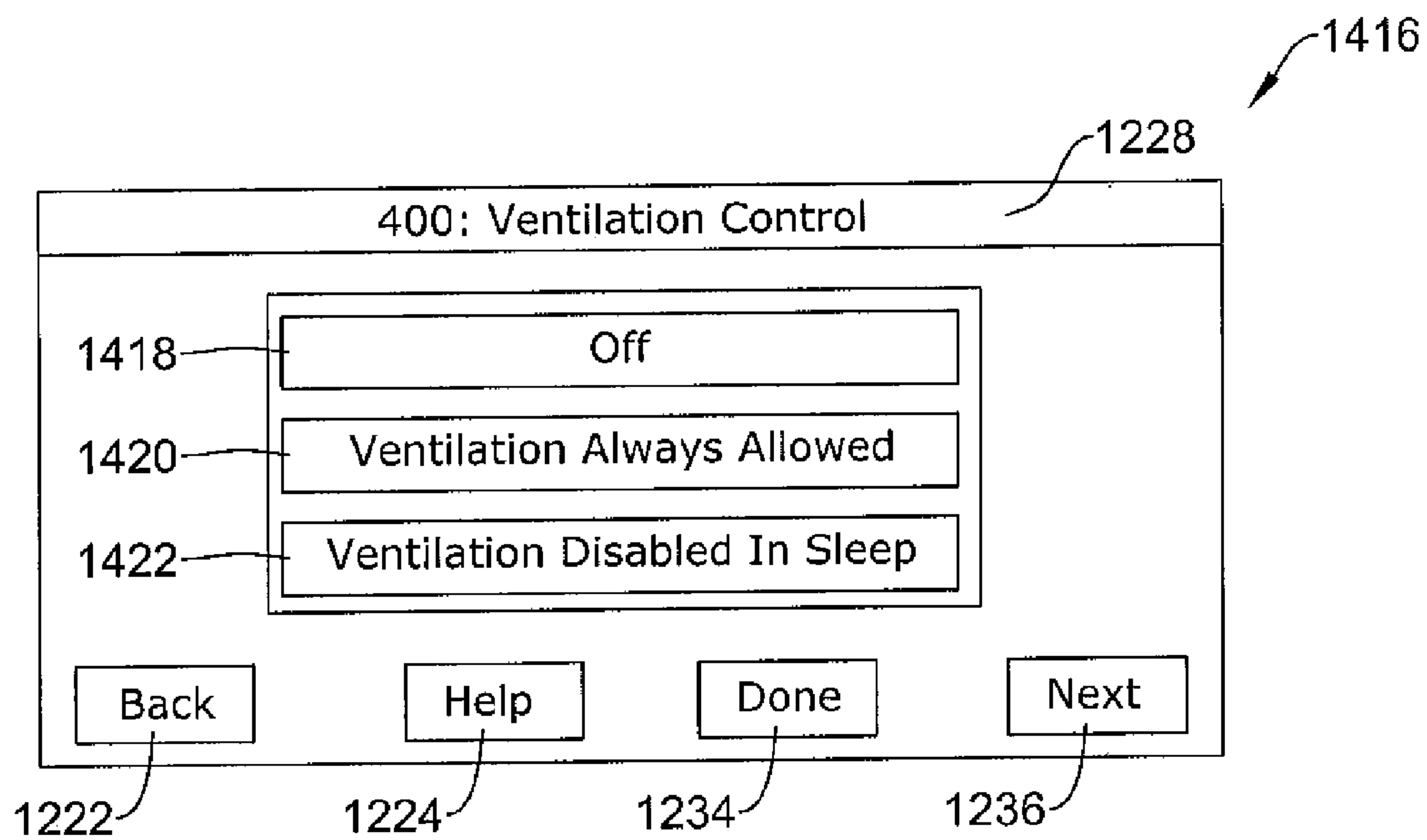
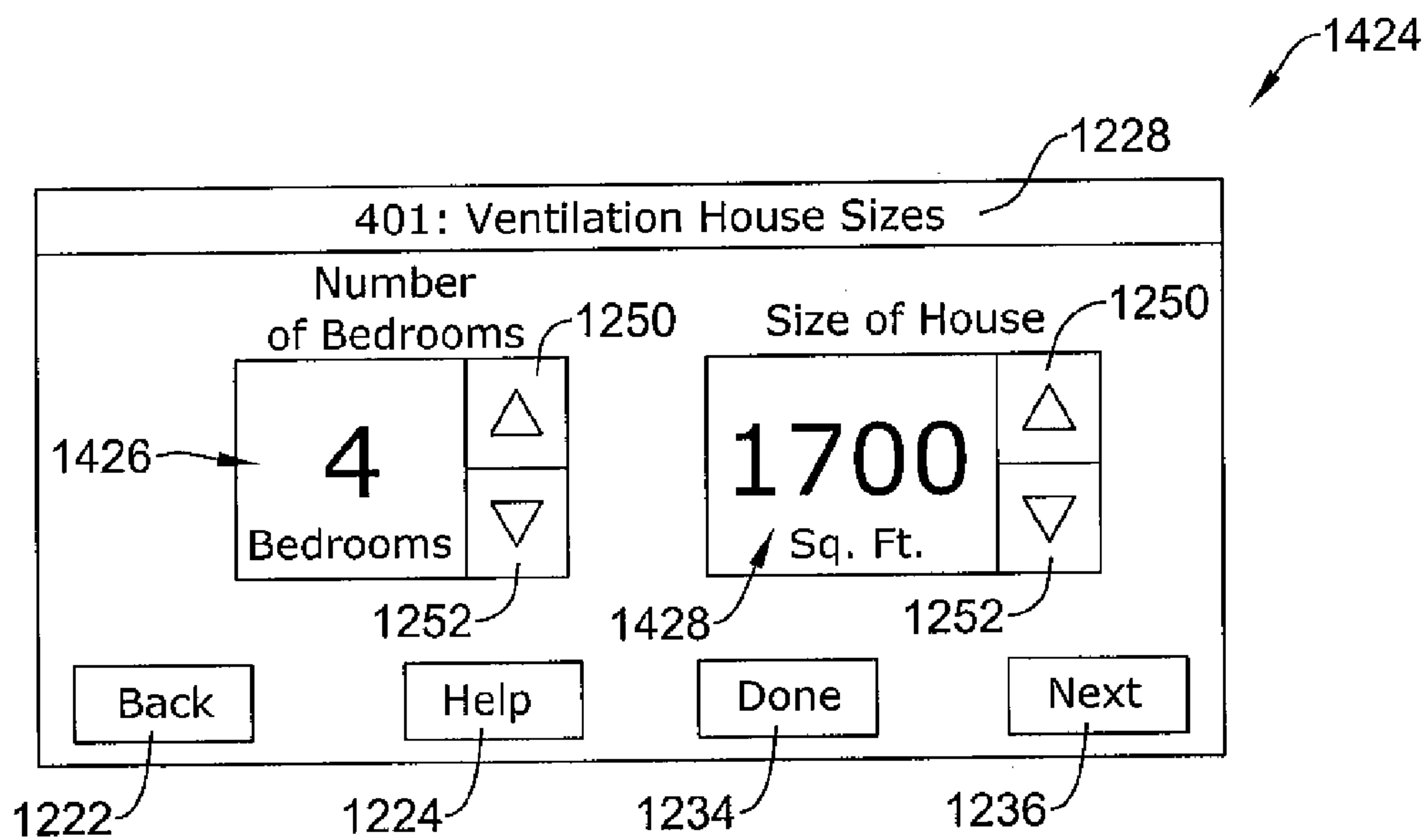
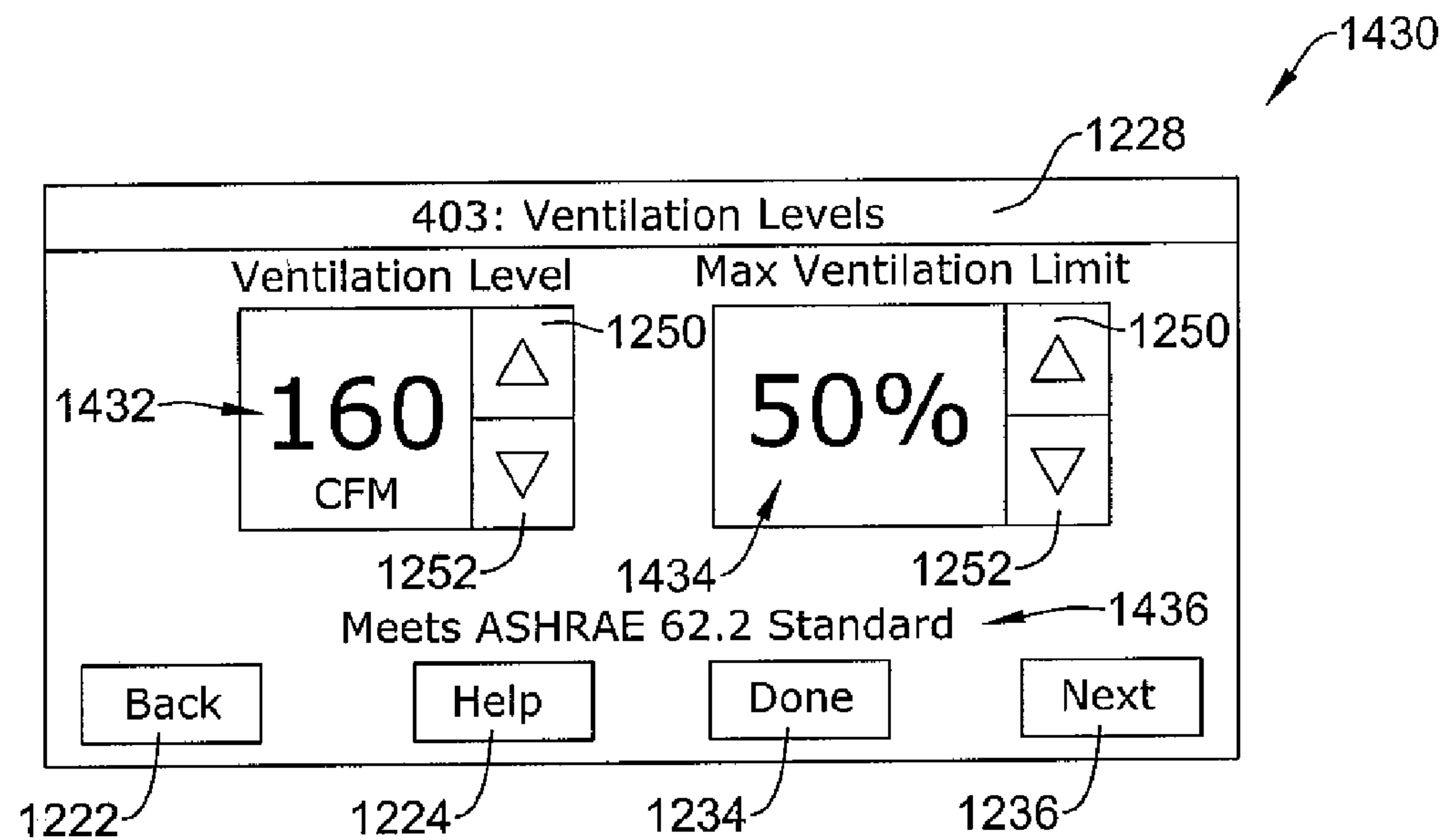
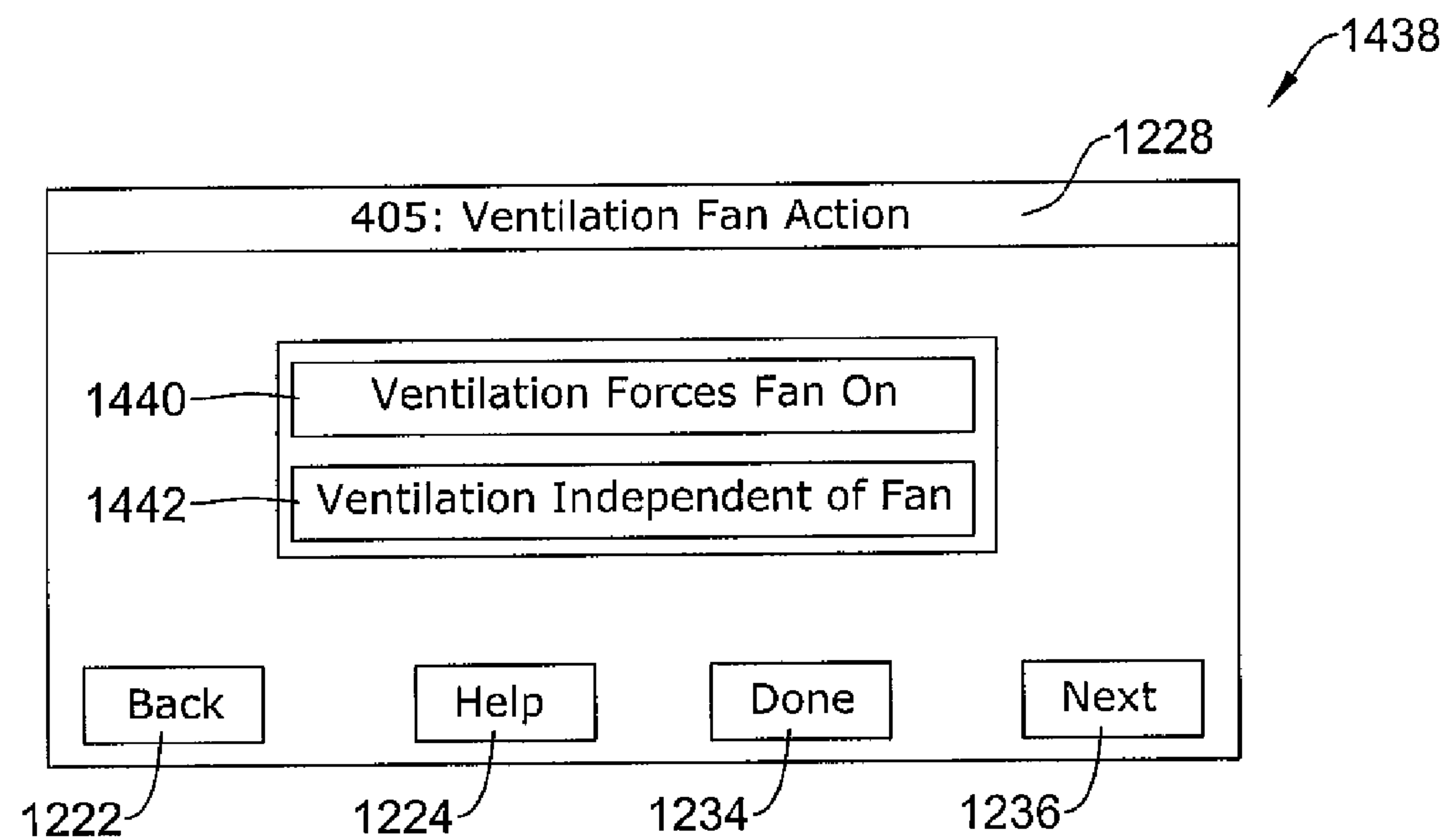


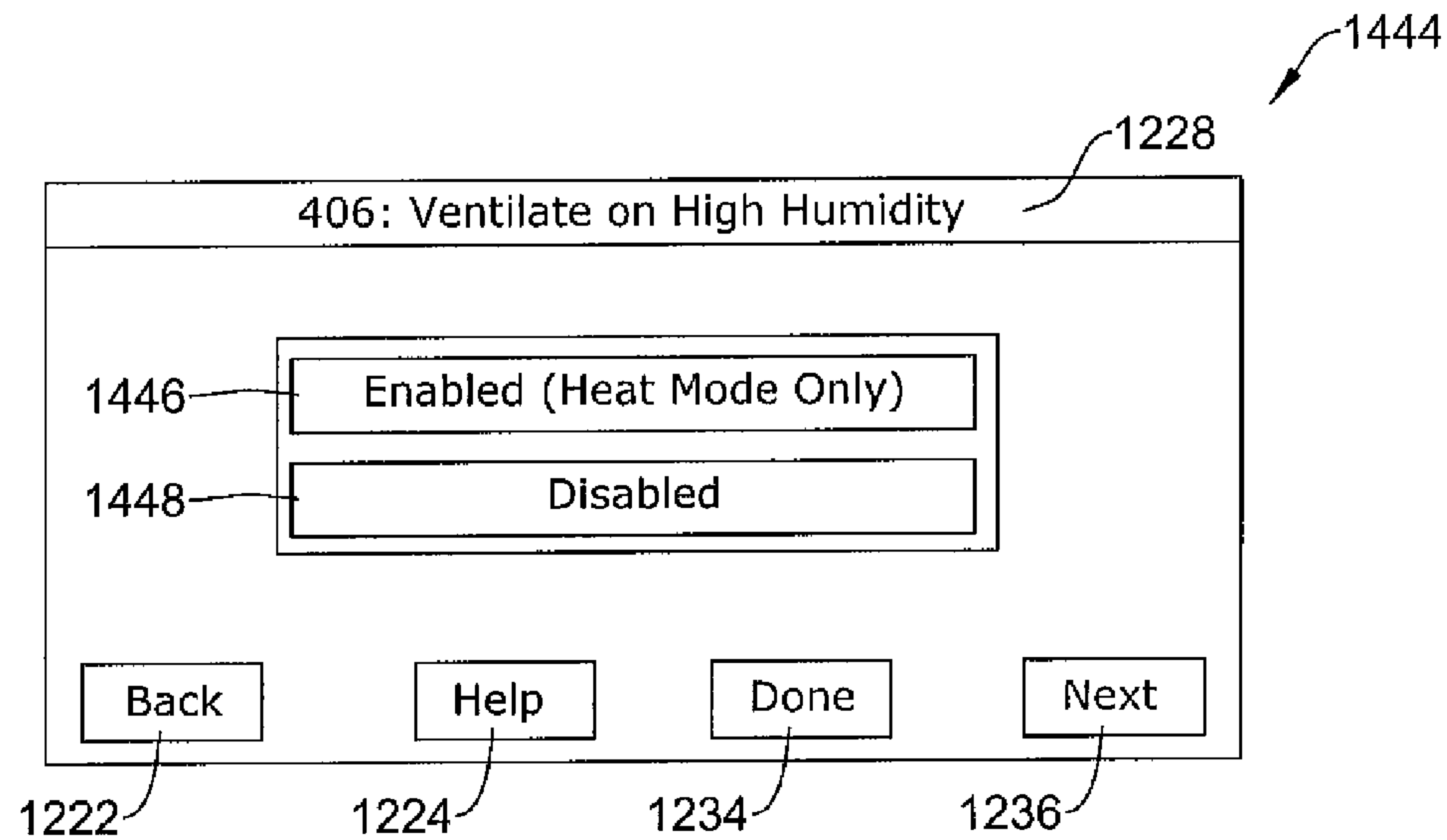
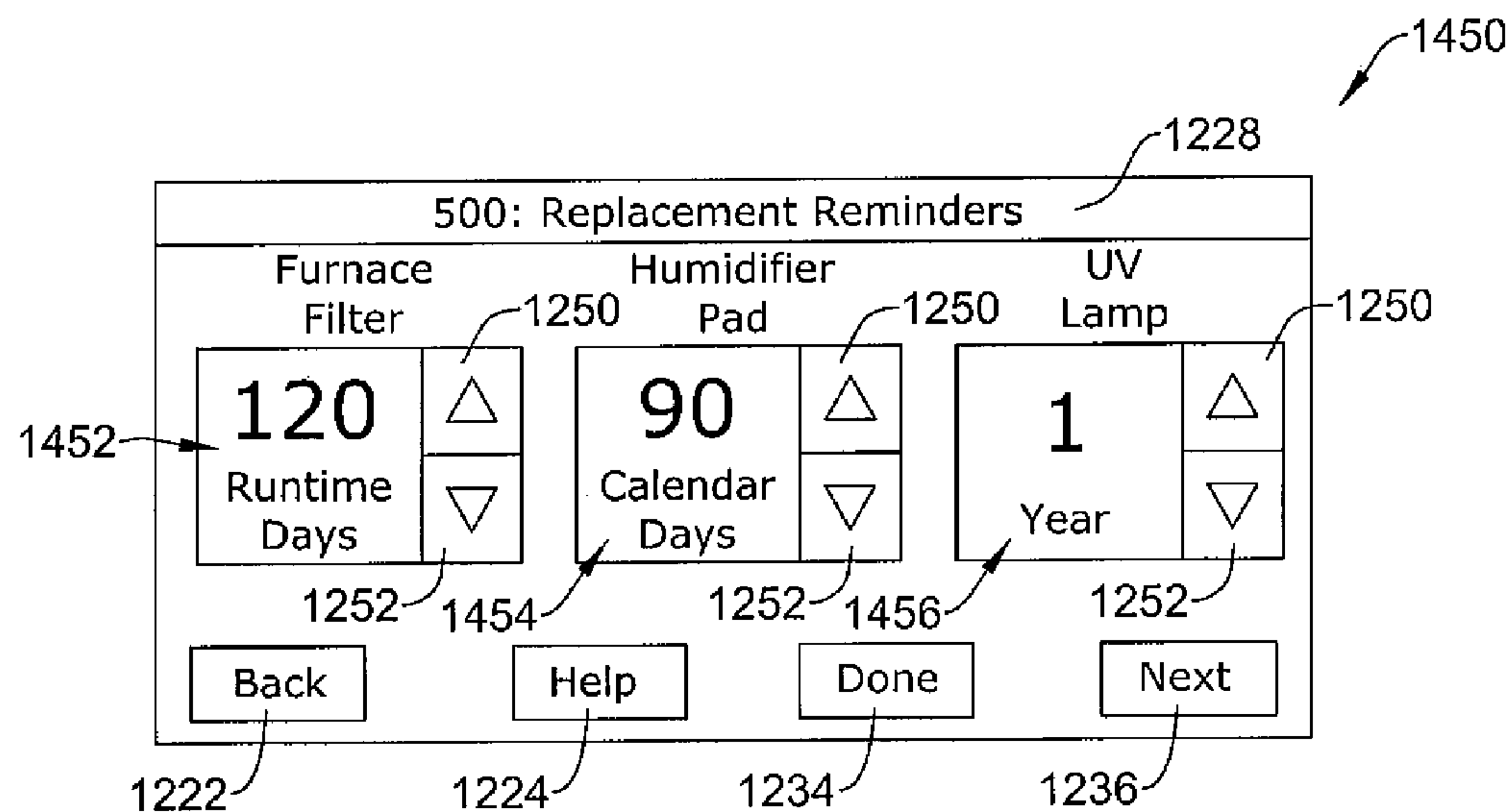
Figure 147

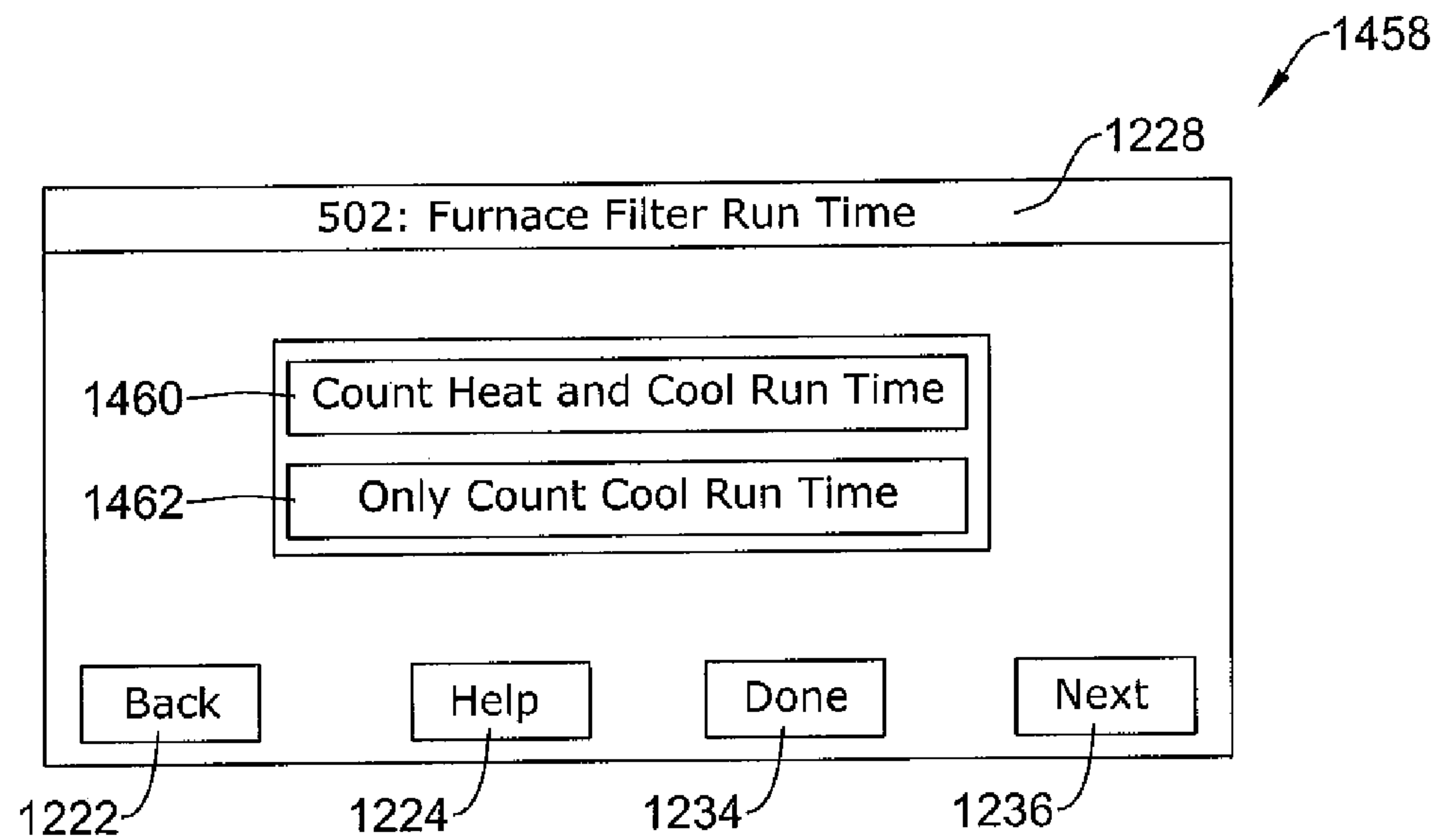
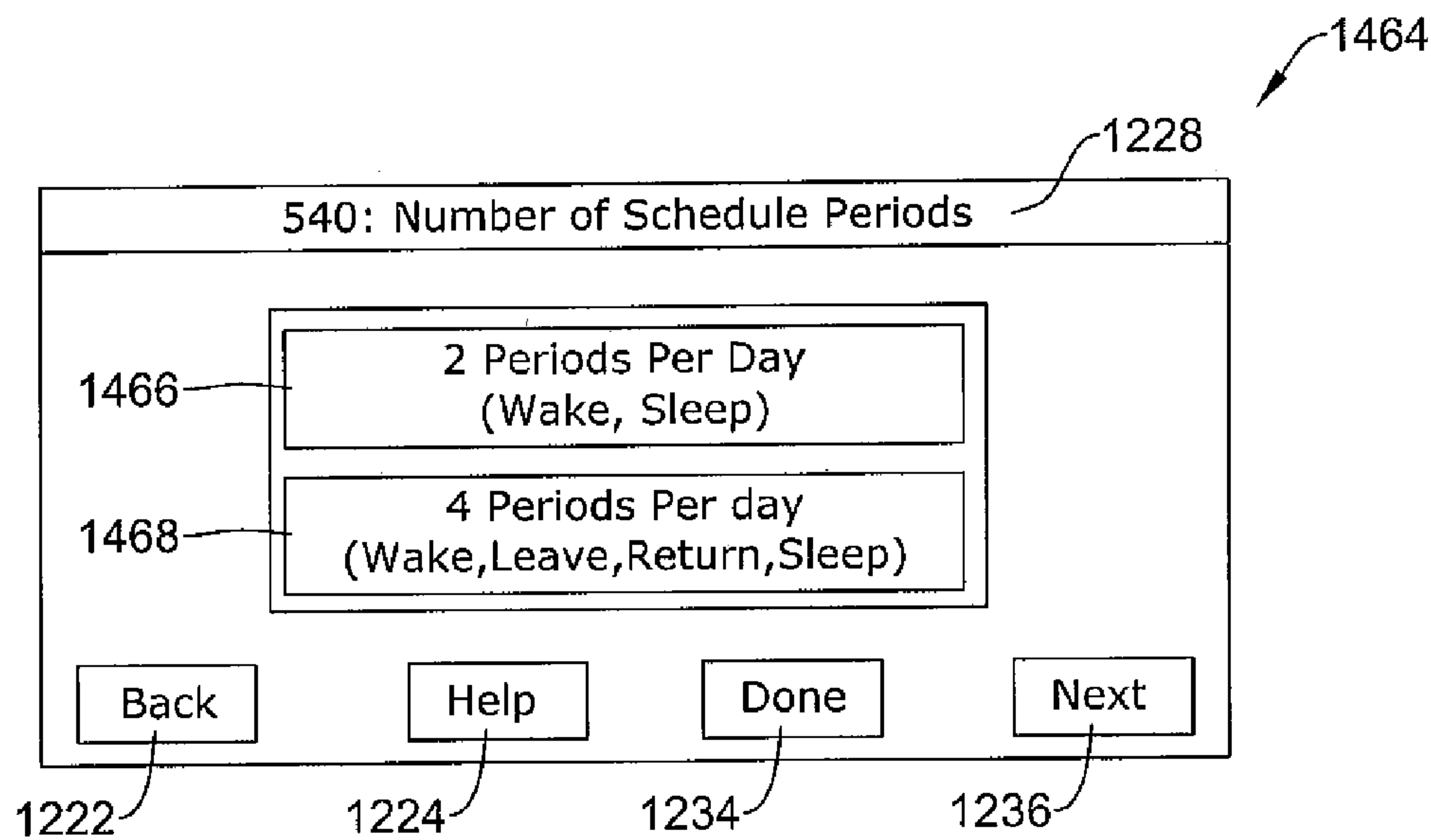
*Figure 148**Figure 149*

*Figure 150**Figure 151*

*Figure 152**Figure 153*

*Figure 154**Figure 155*

*Figure 156**Figure 157*

*Figure 158**Figure 159*

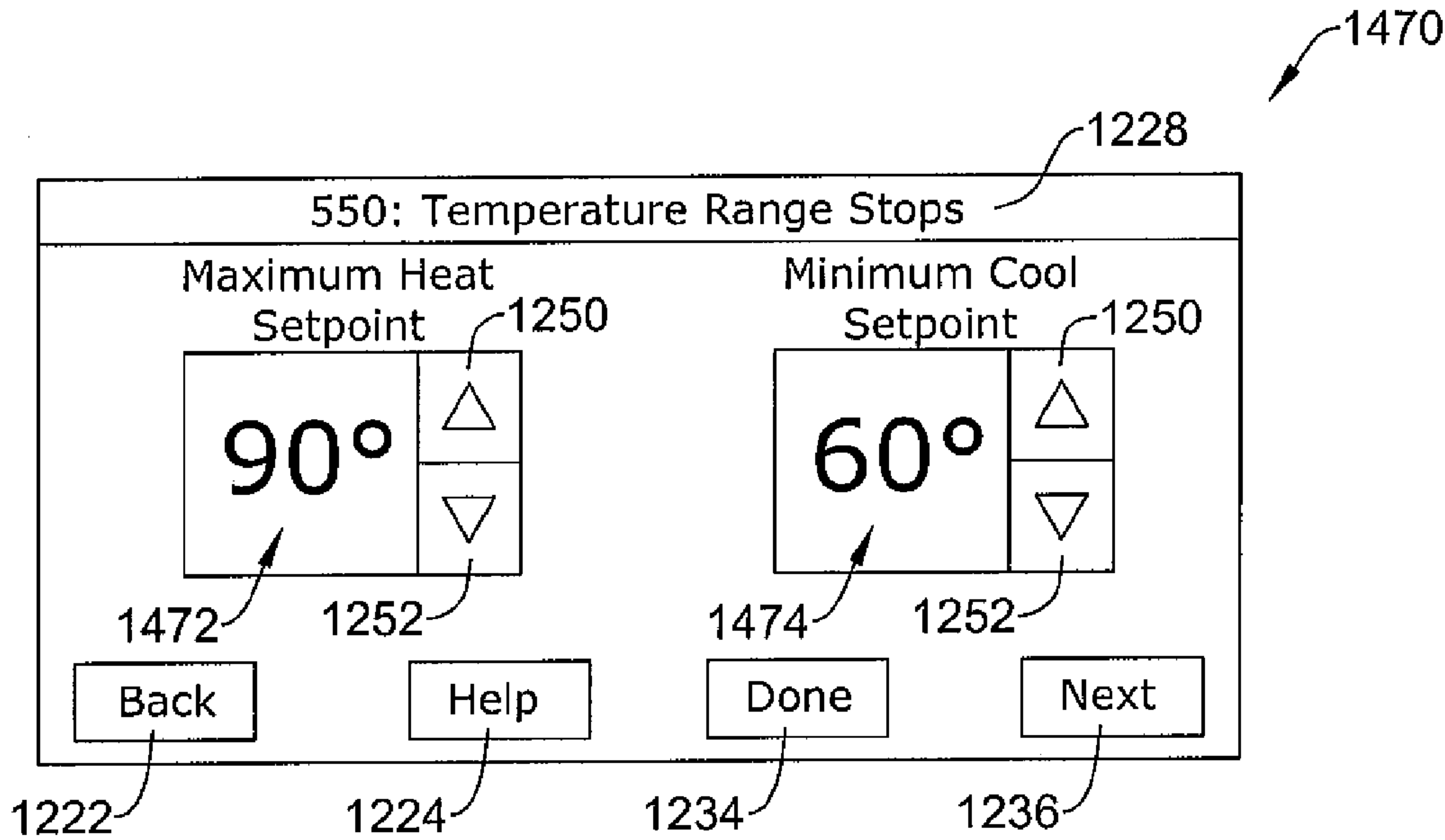


Figure 160

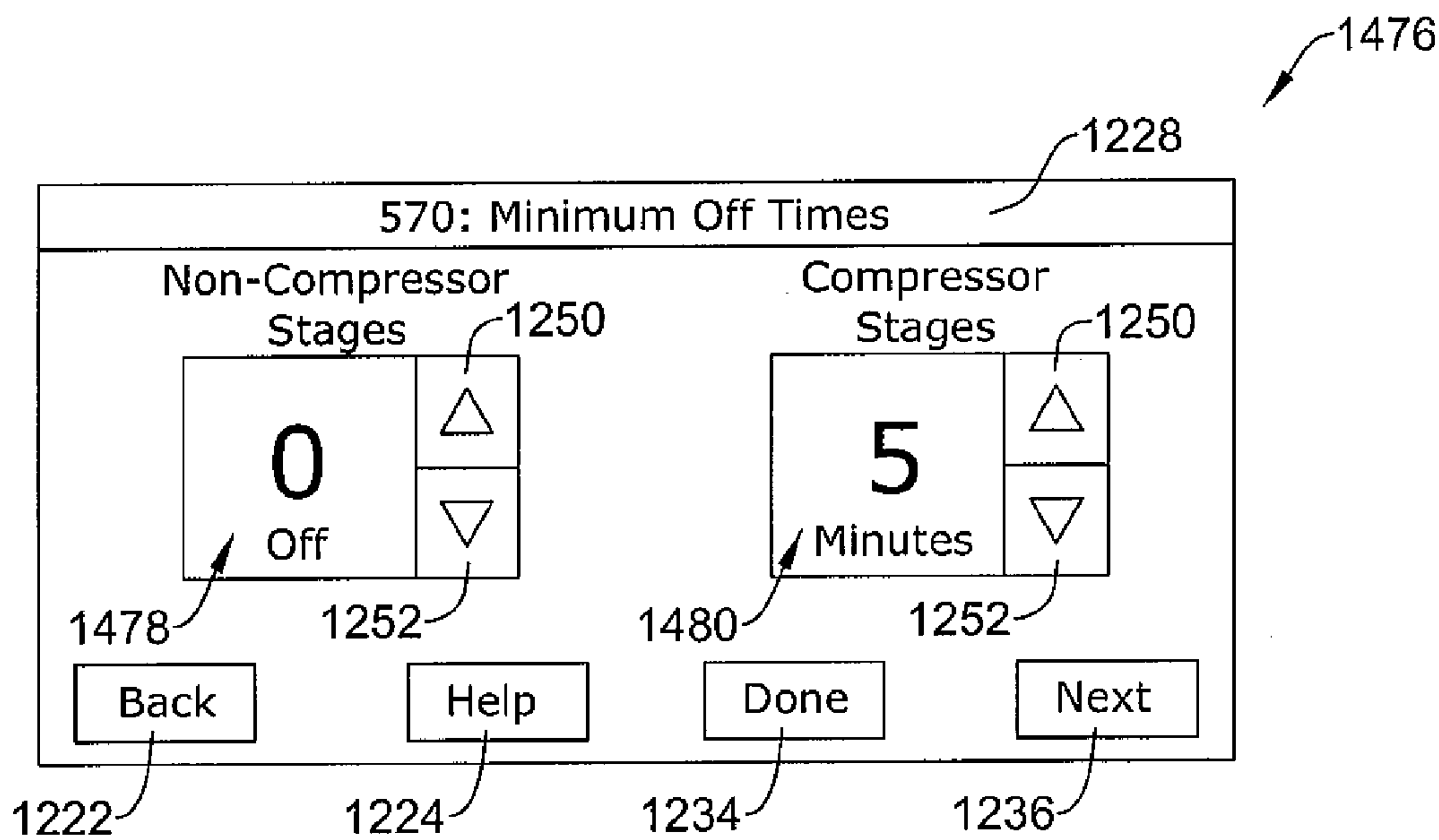
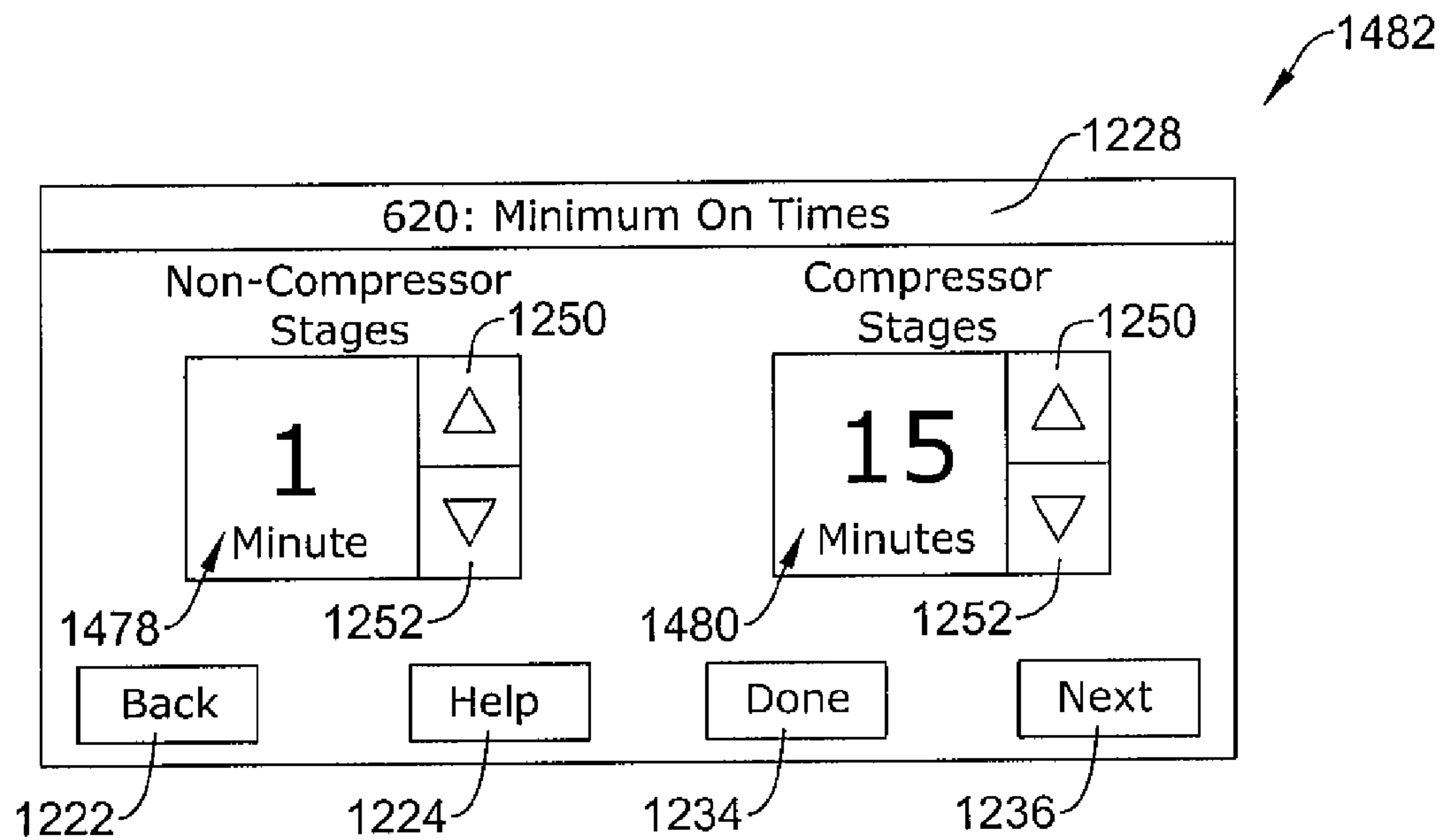
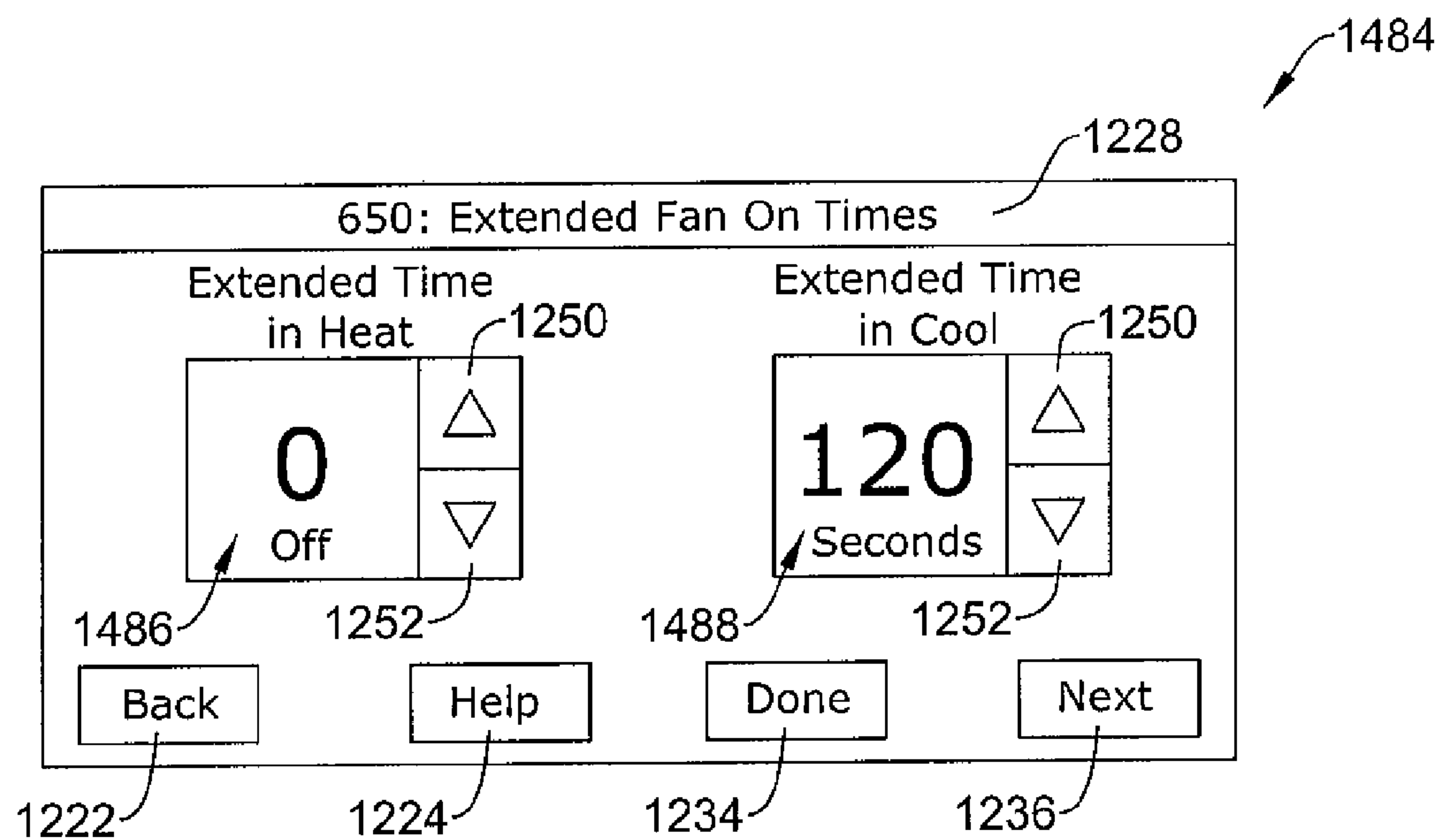
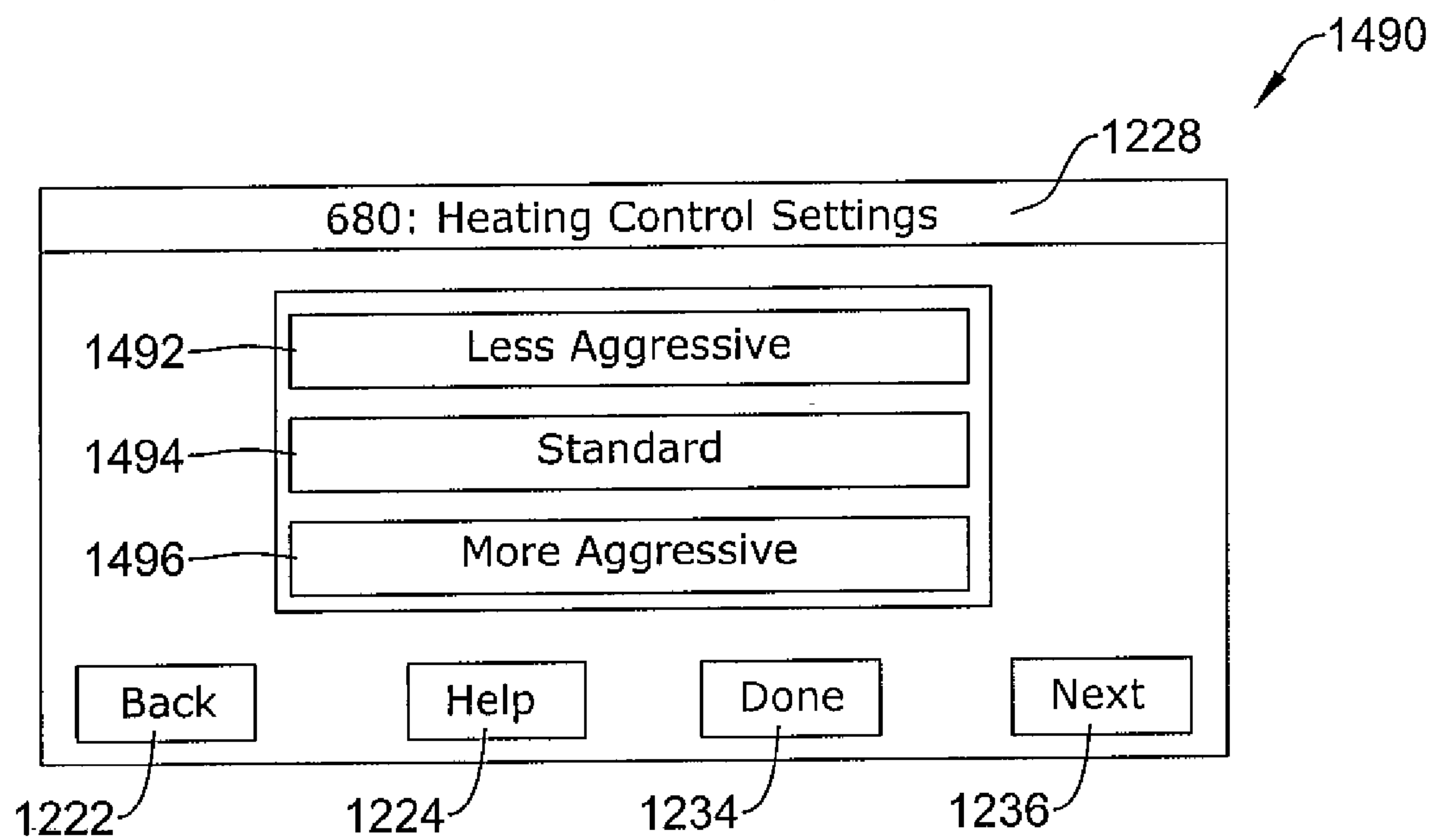
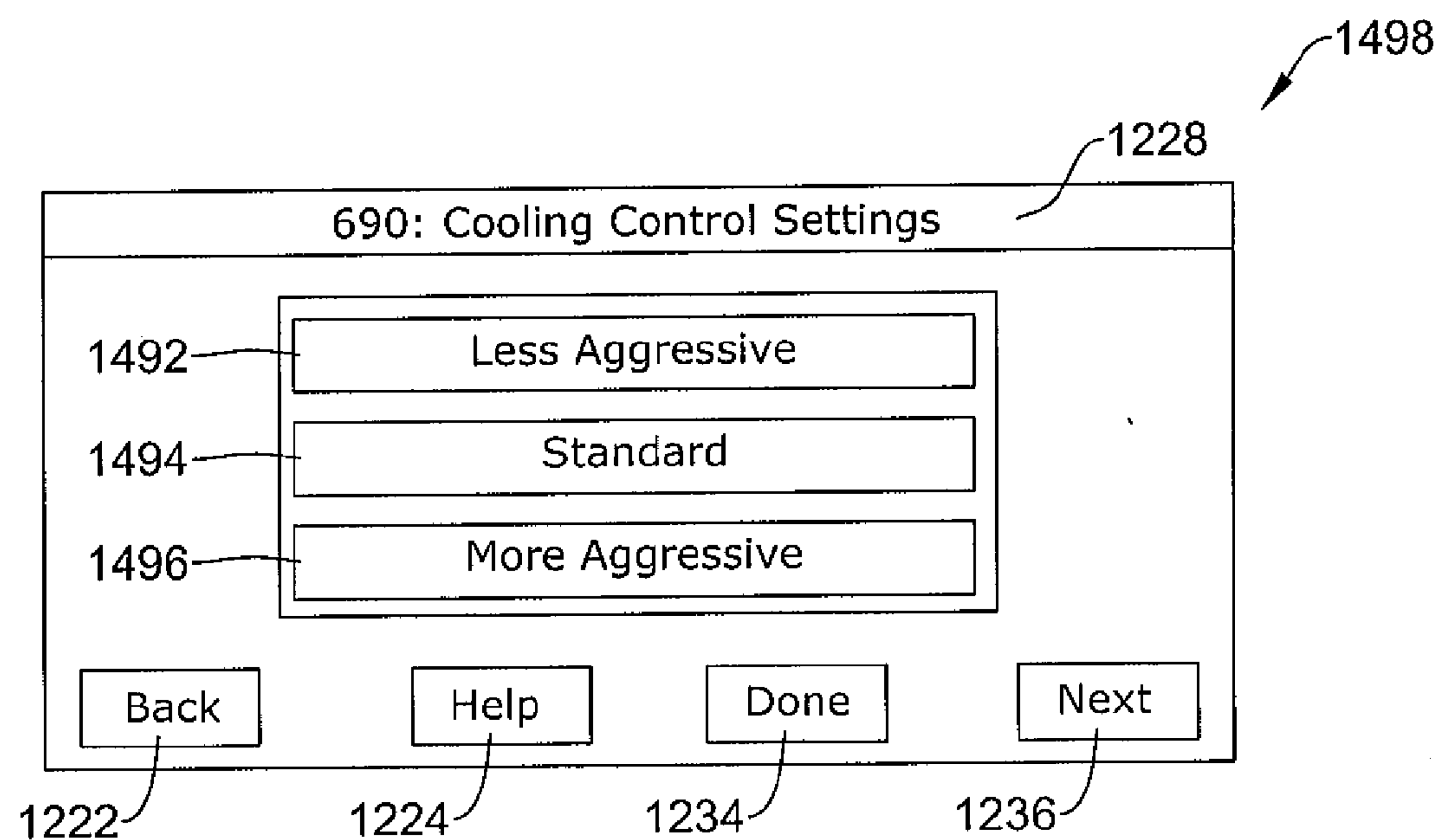
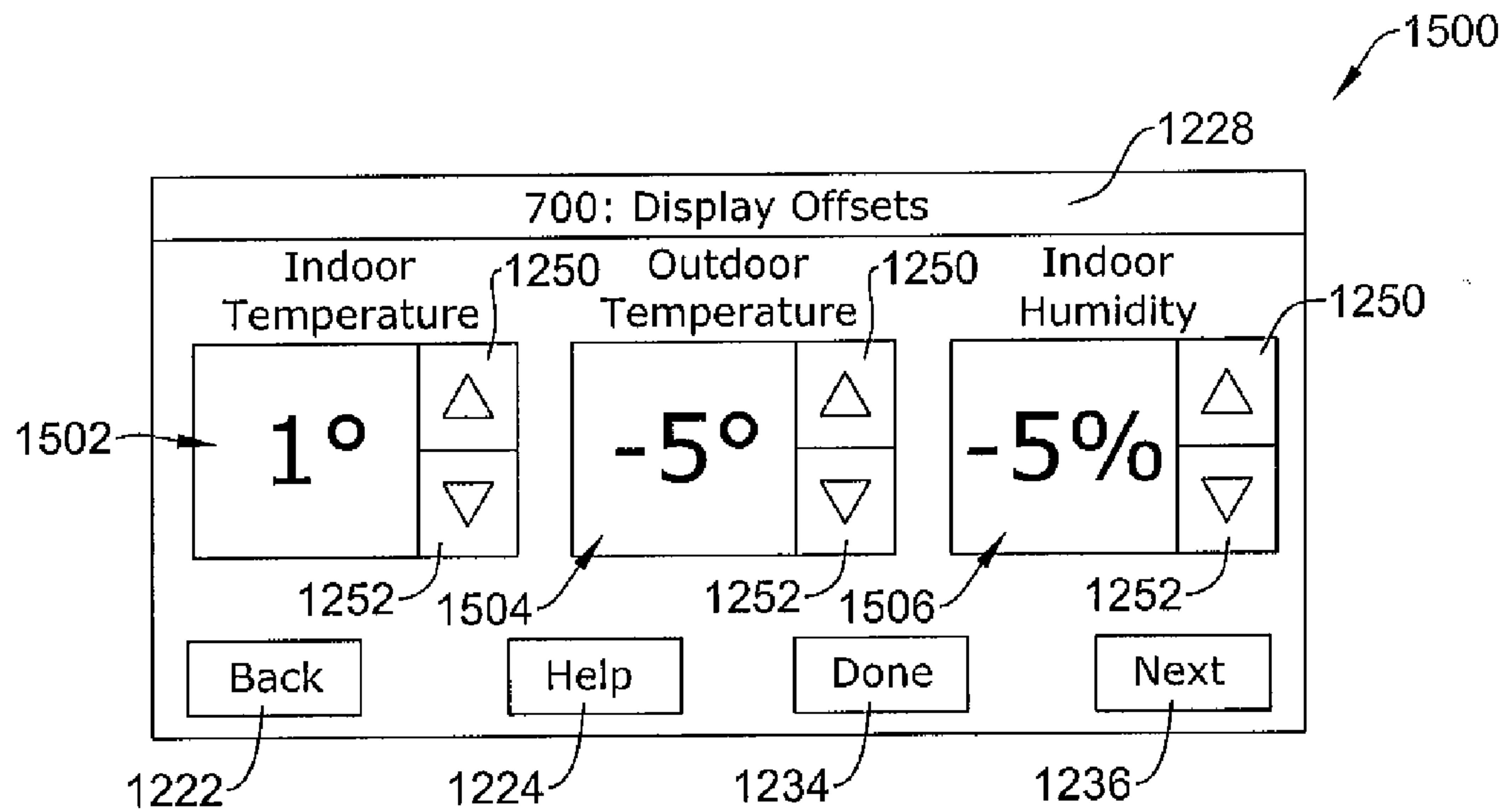
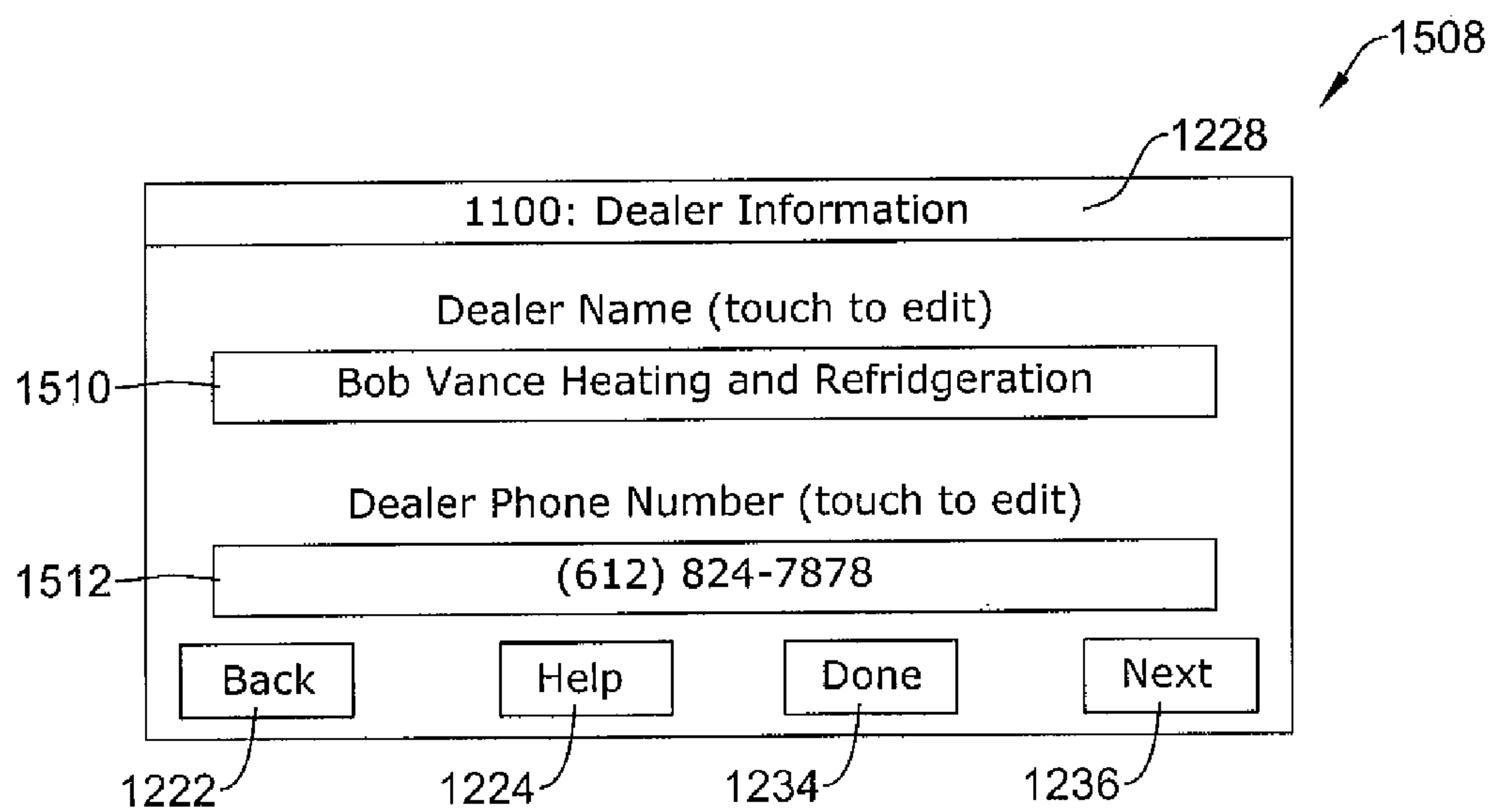
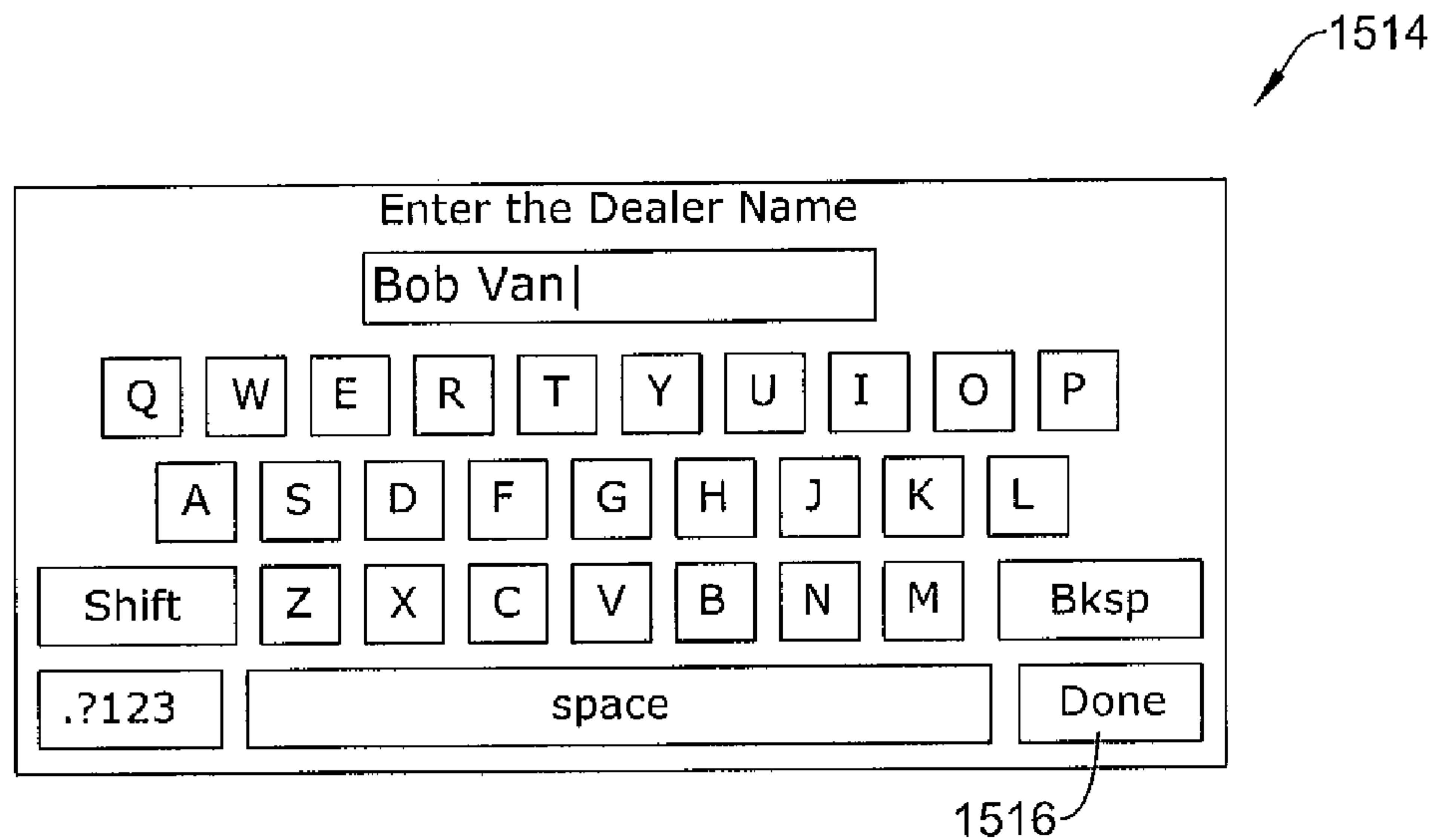
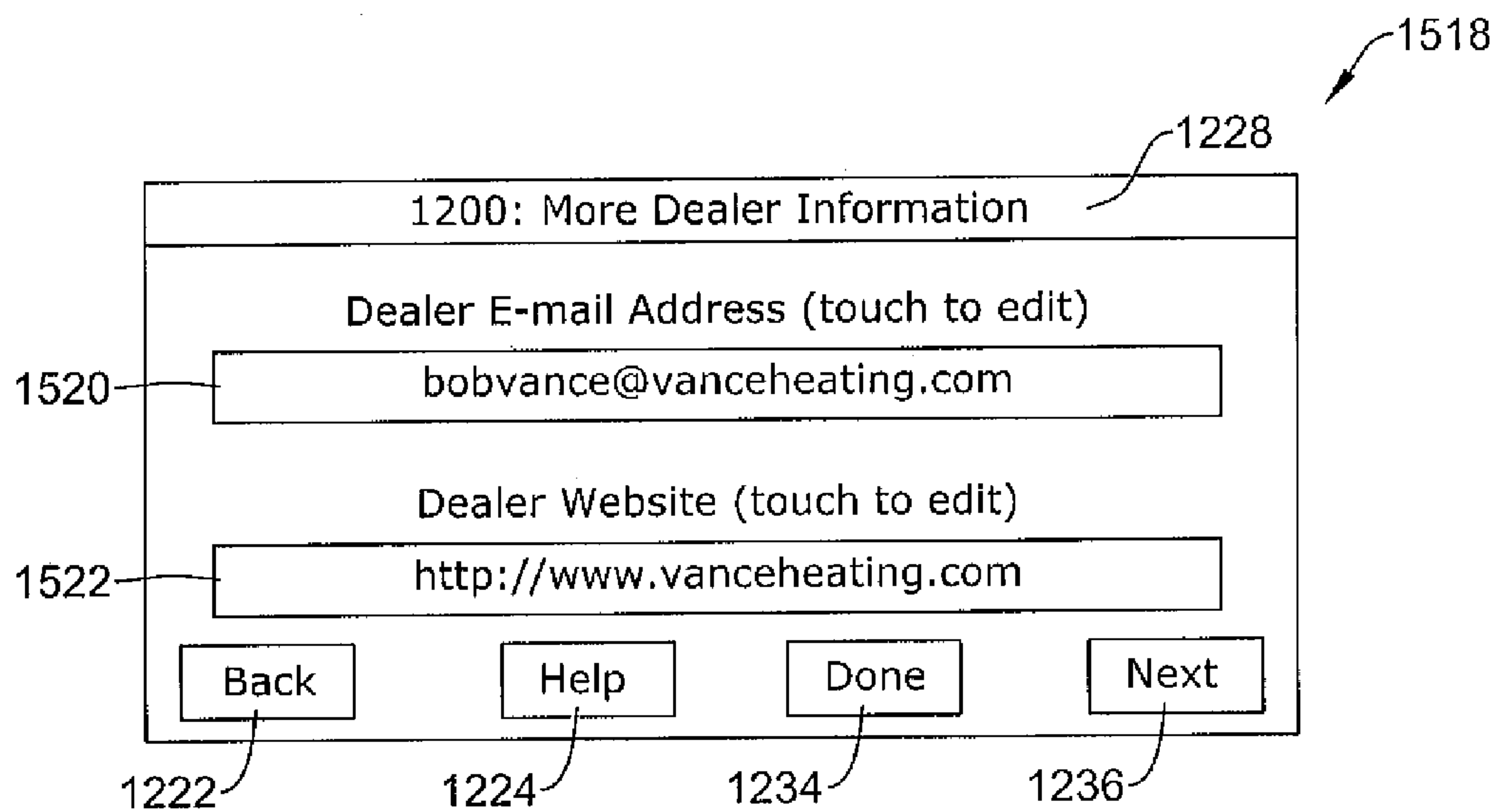


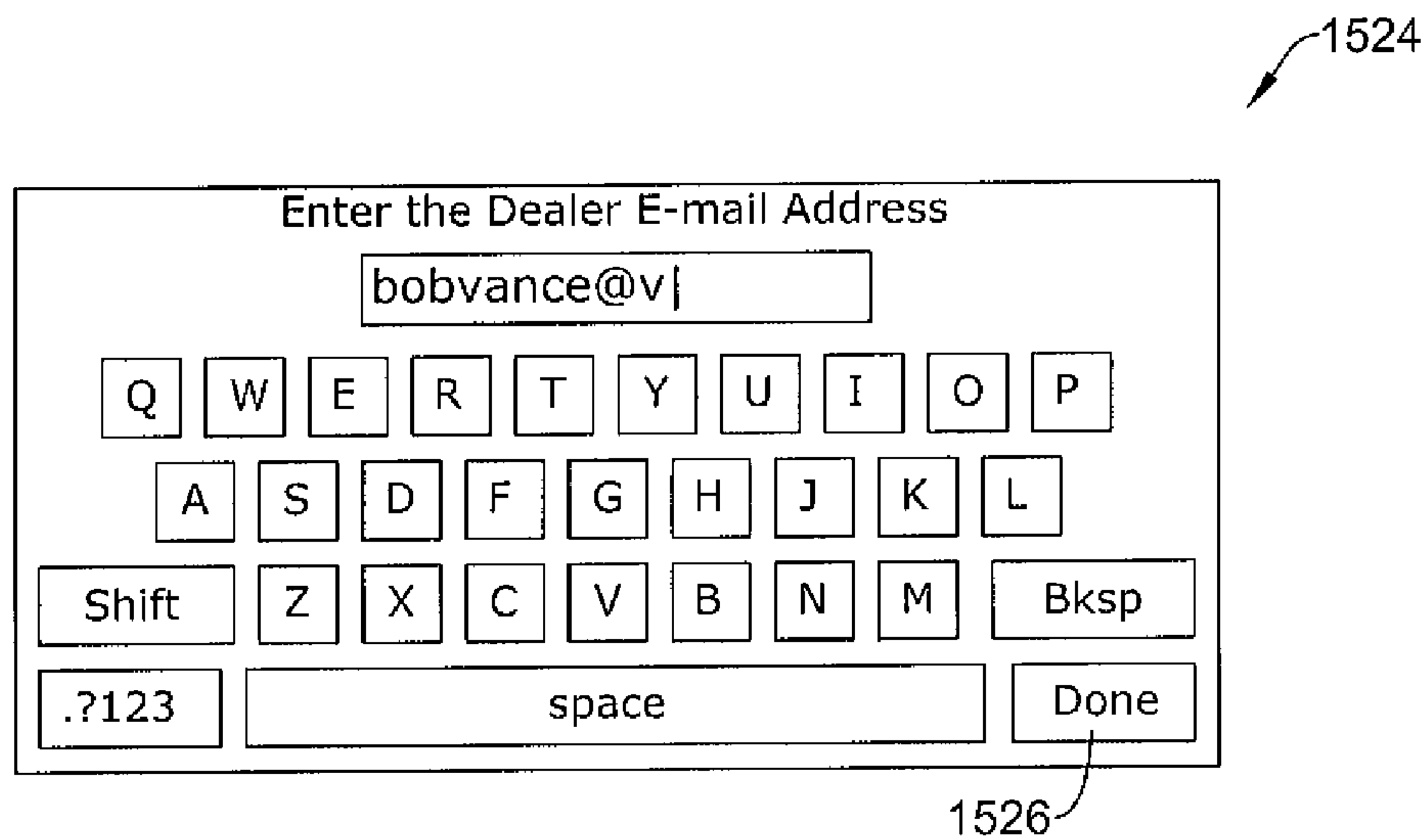
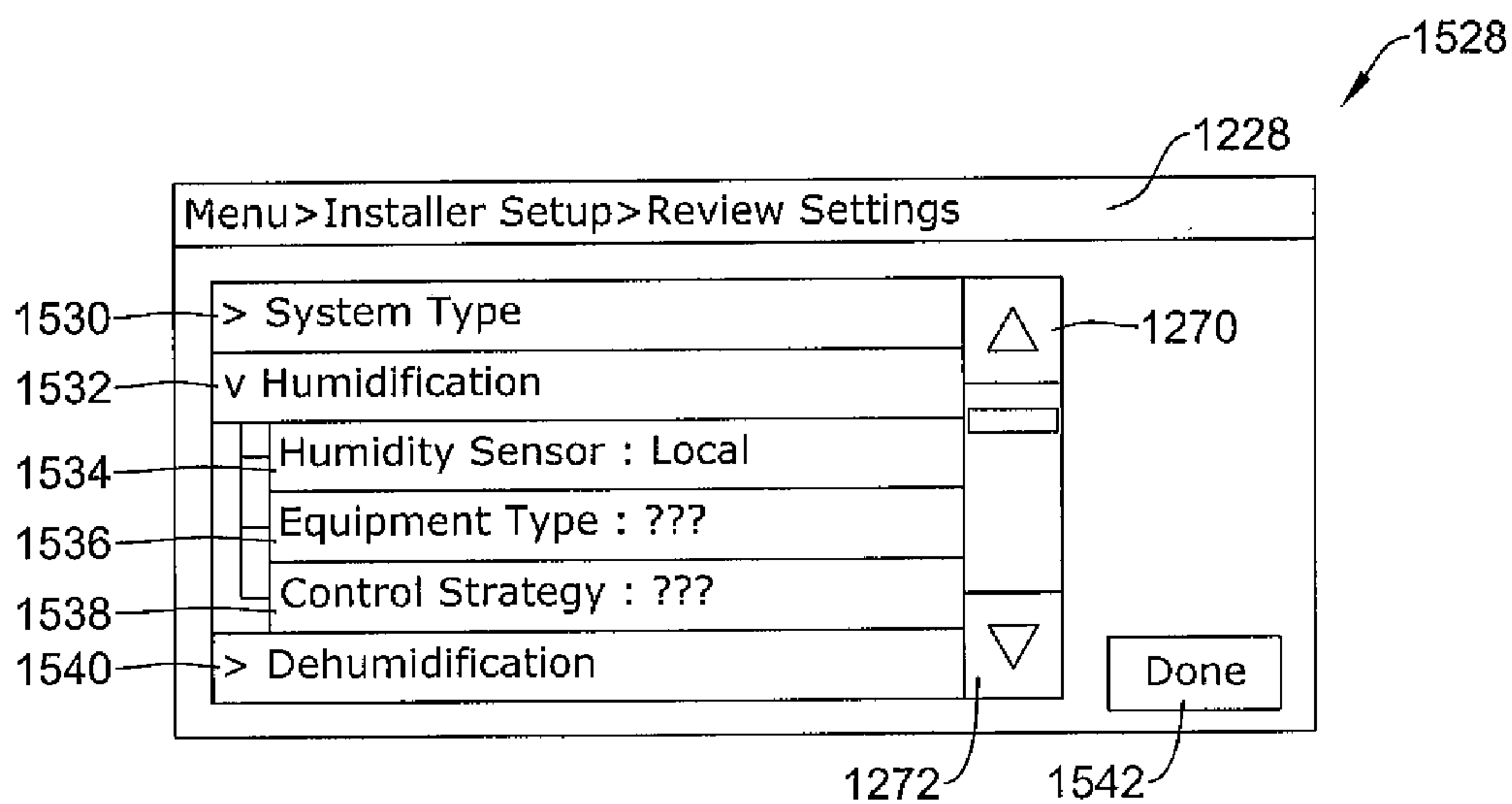
Figure 161

*Figure 162**Figure 163*

*Figure 164**Figure 165*

*Figure 166**Figure 167*

*Figure 168**Figure 169*

*Figure 170**Figure 171*

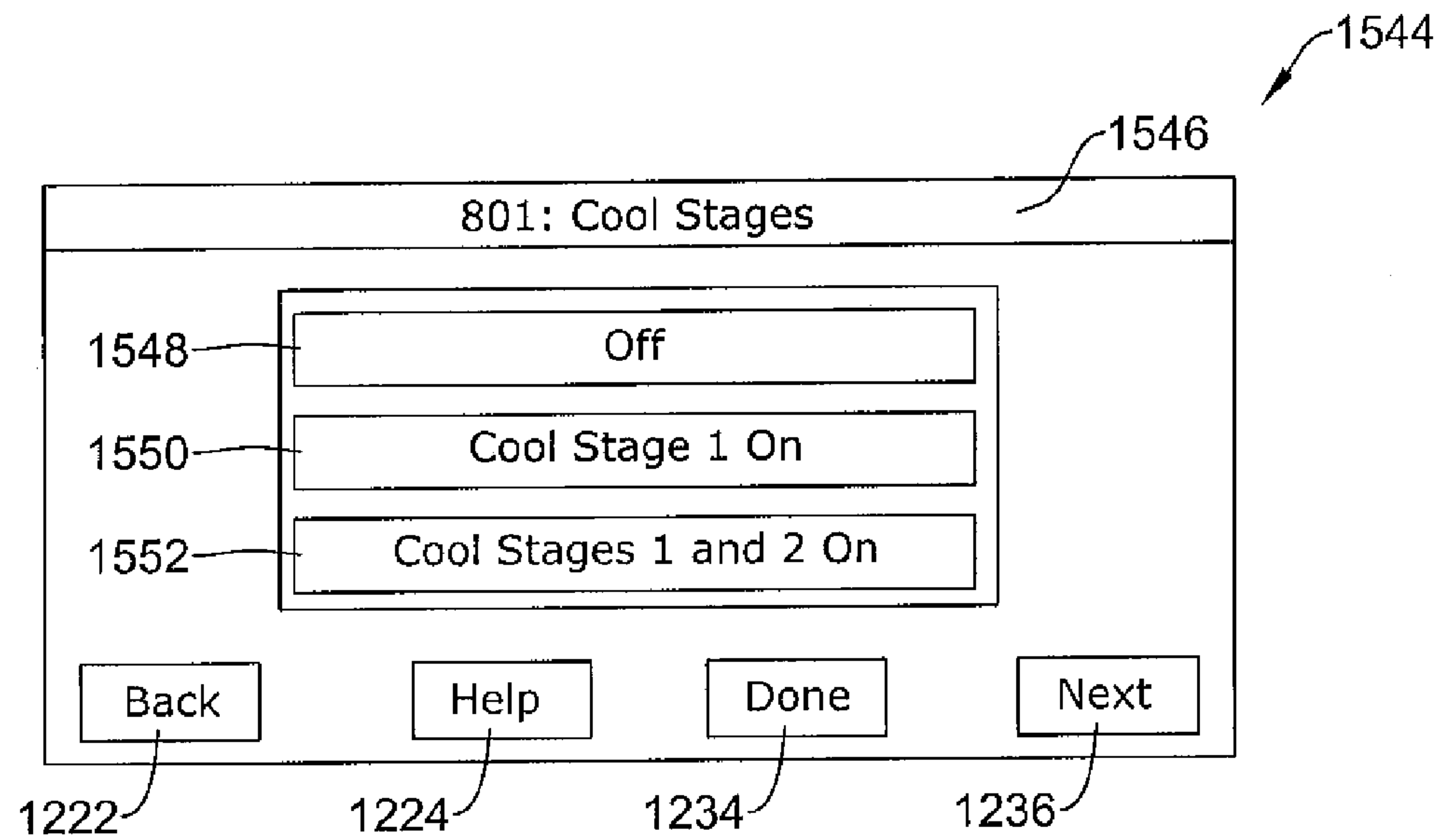


Figure 172

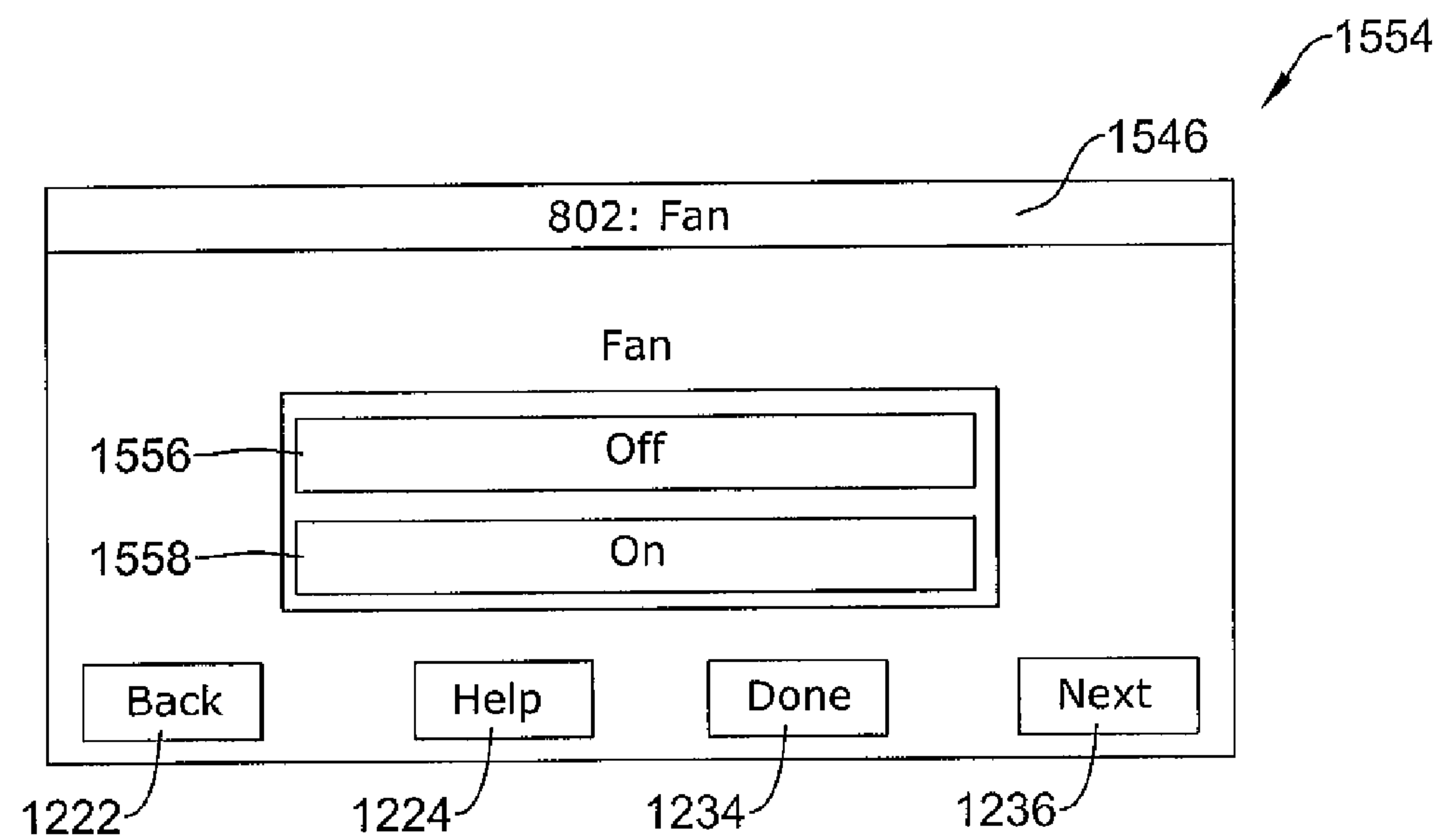
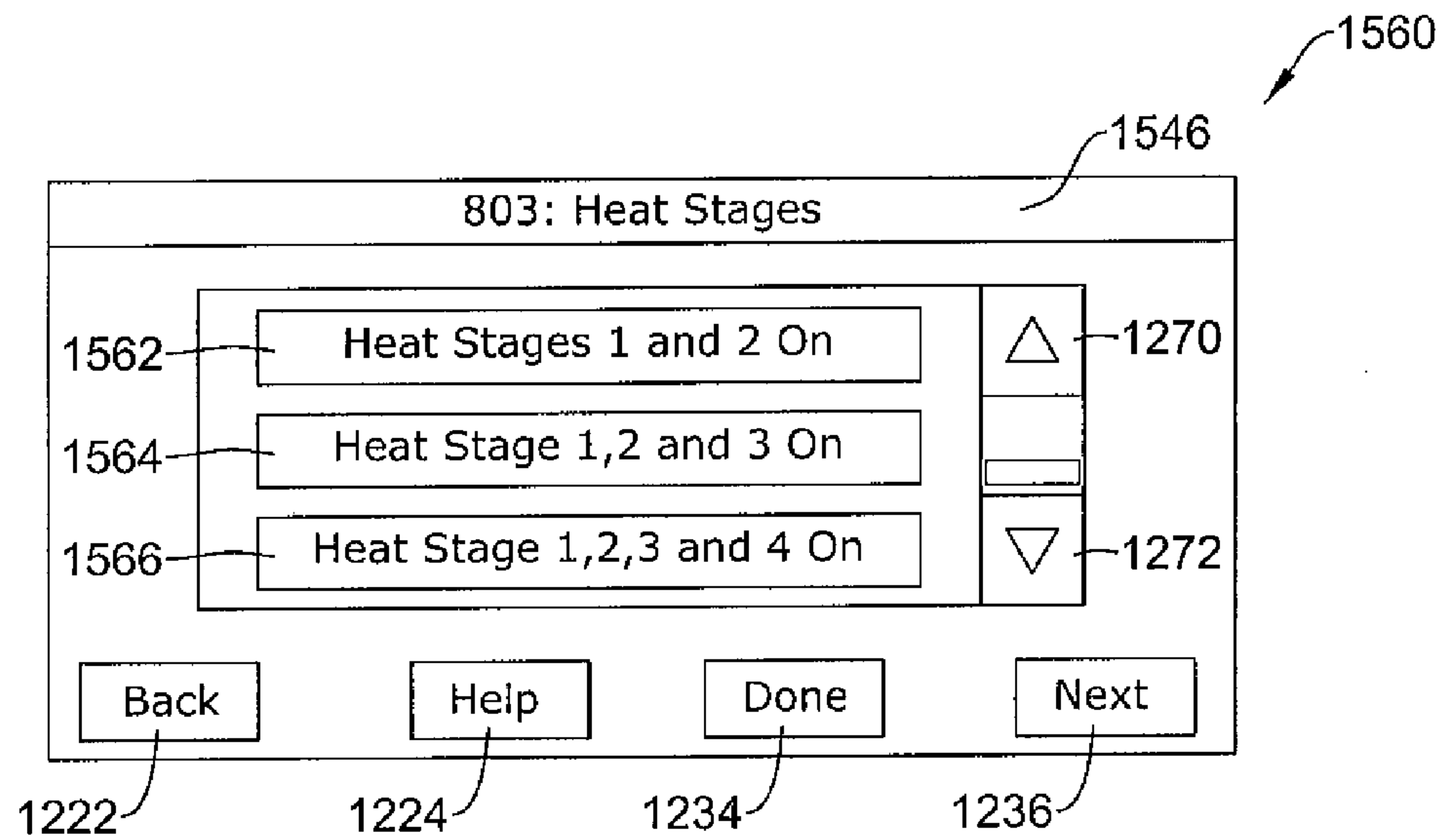
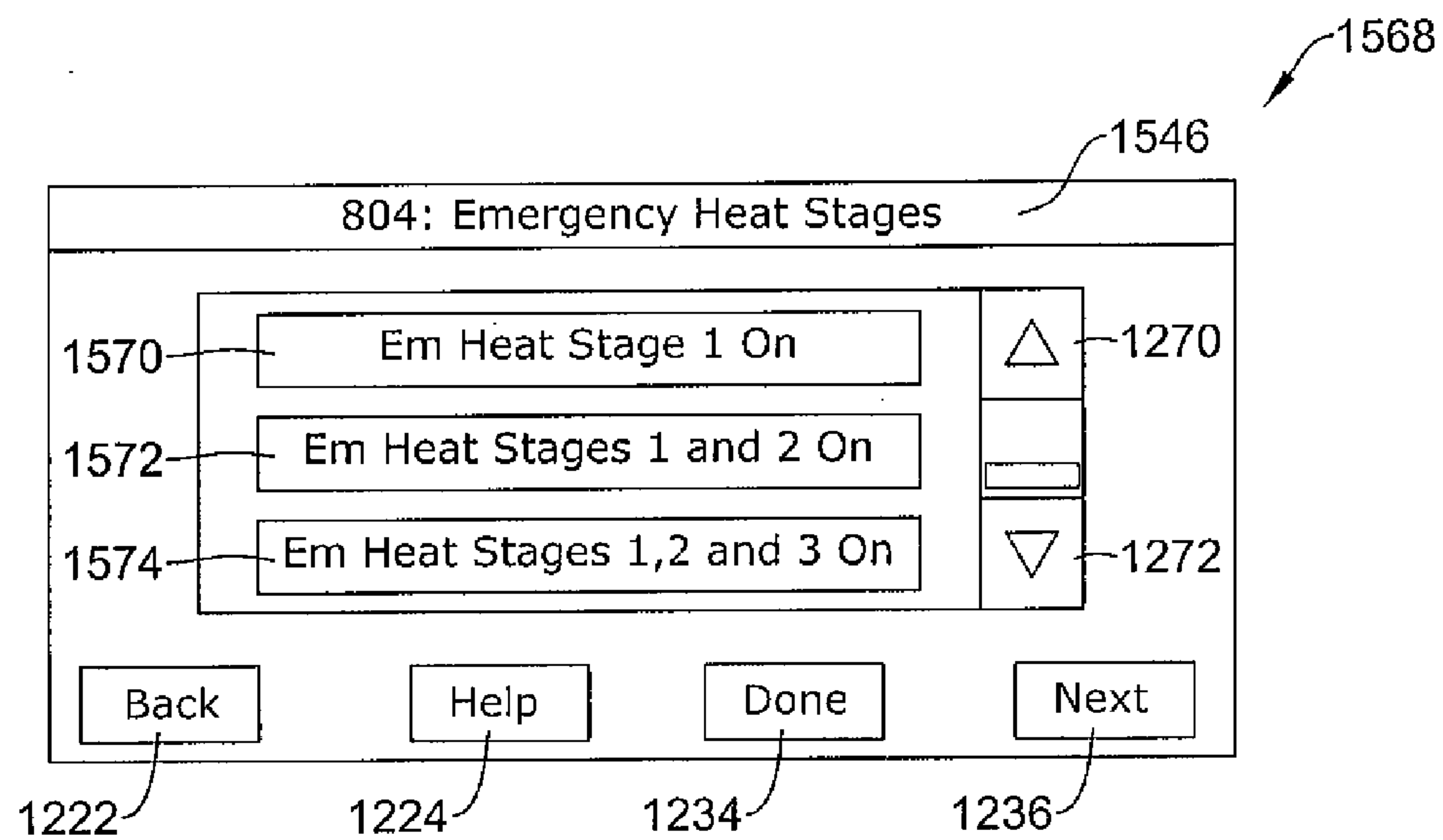
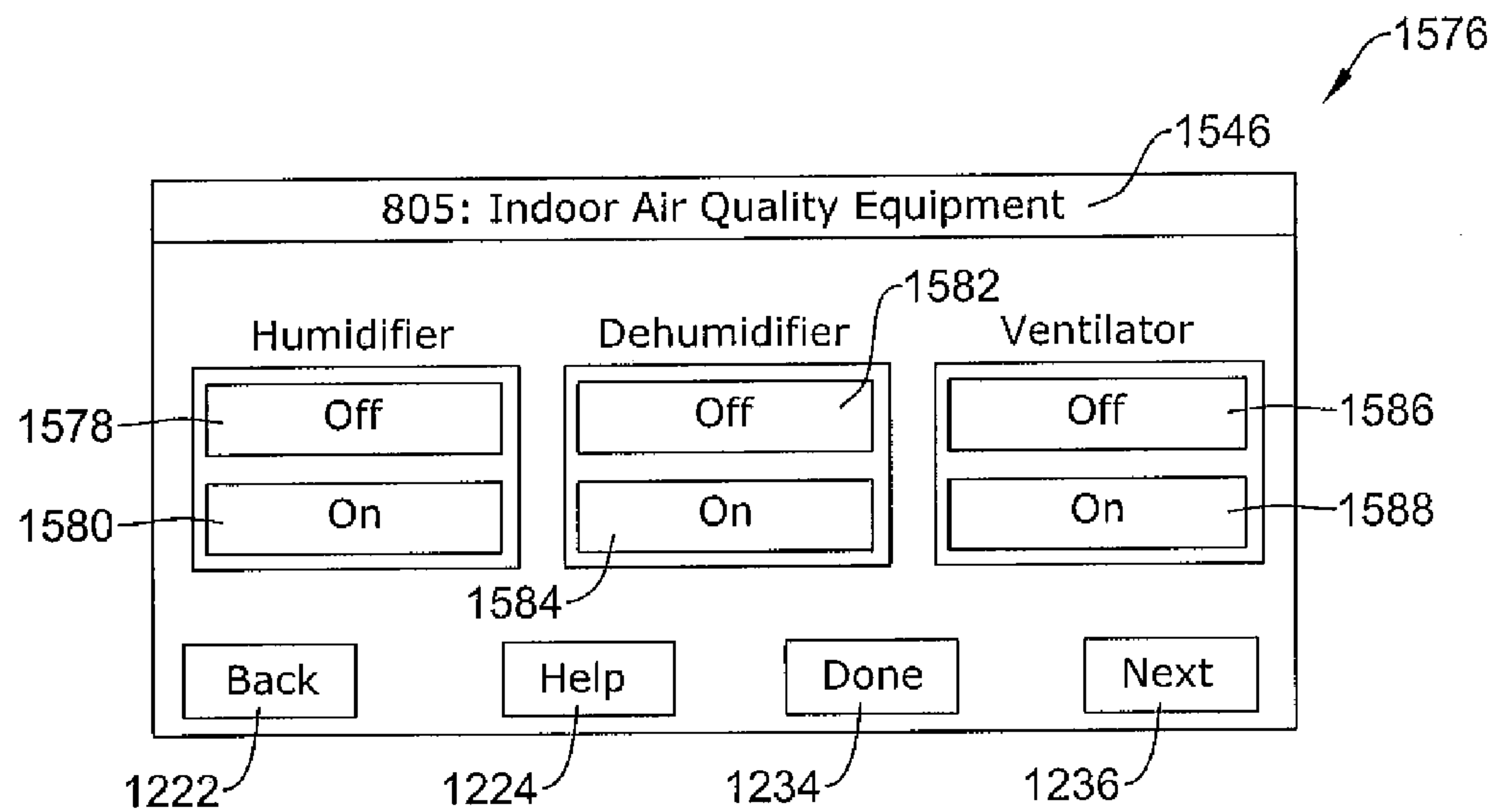
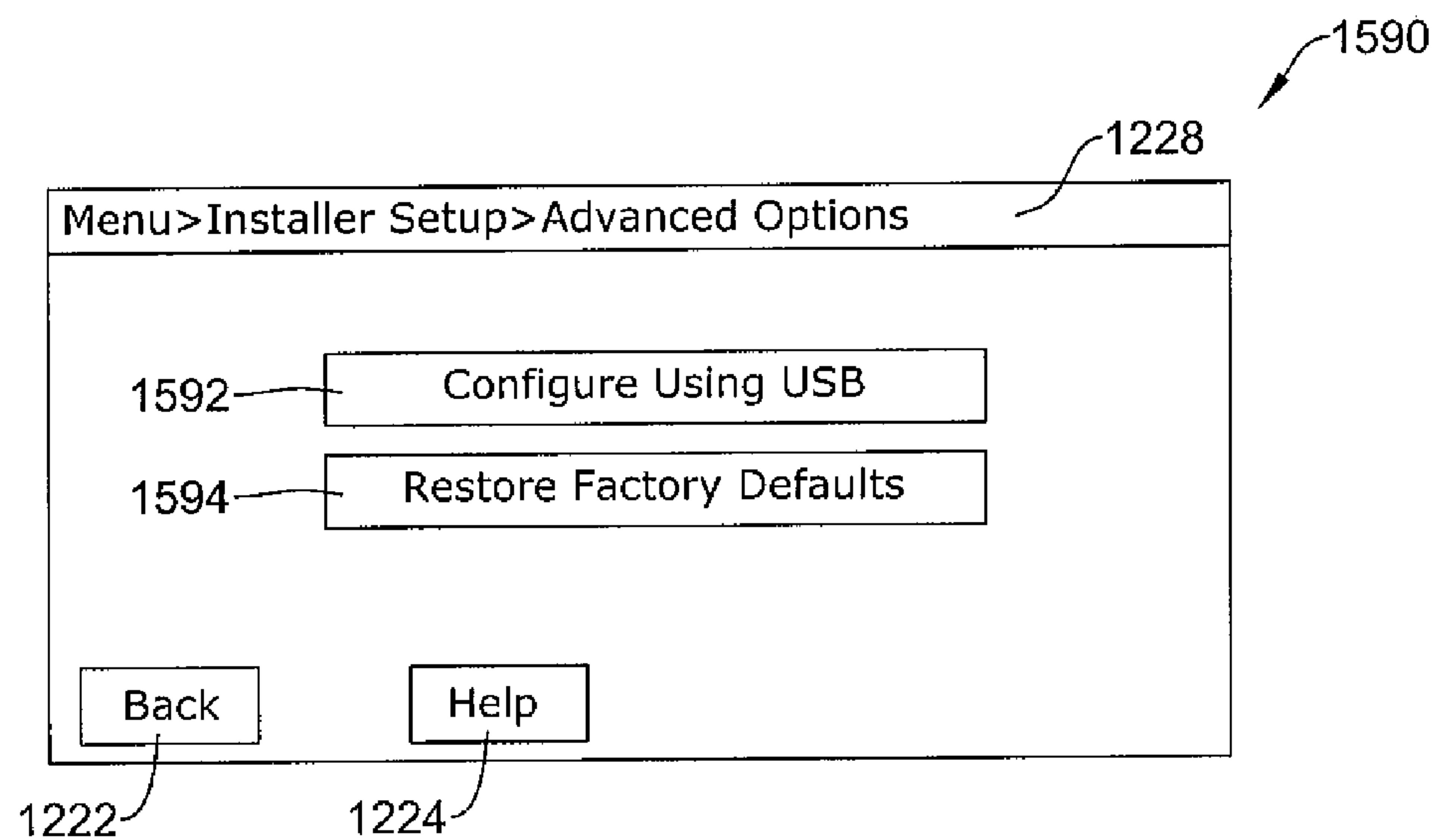


Figure 173

*Figure 174**Figure 175*

*Figure 176**Figure 177*

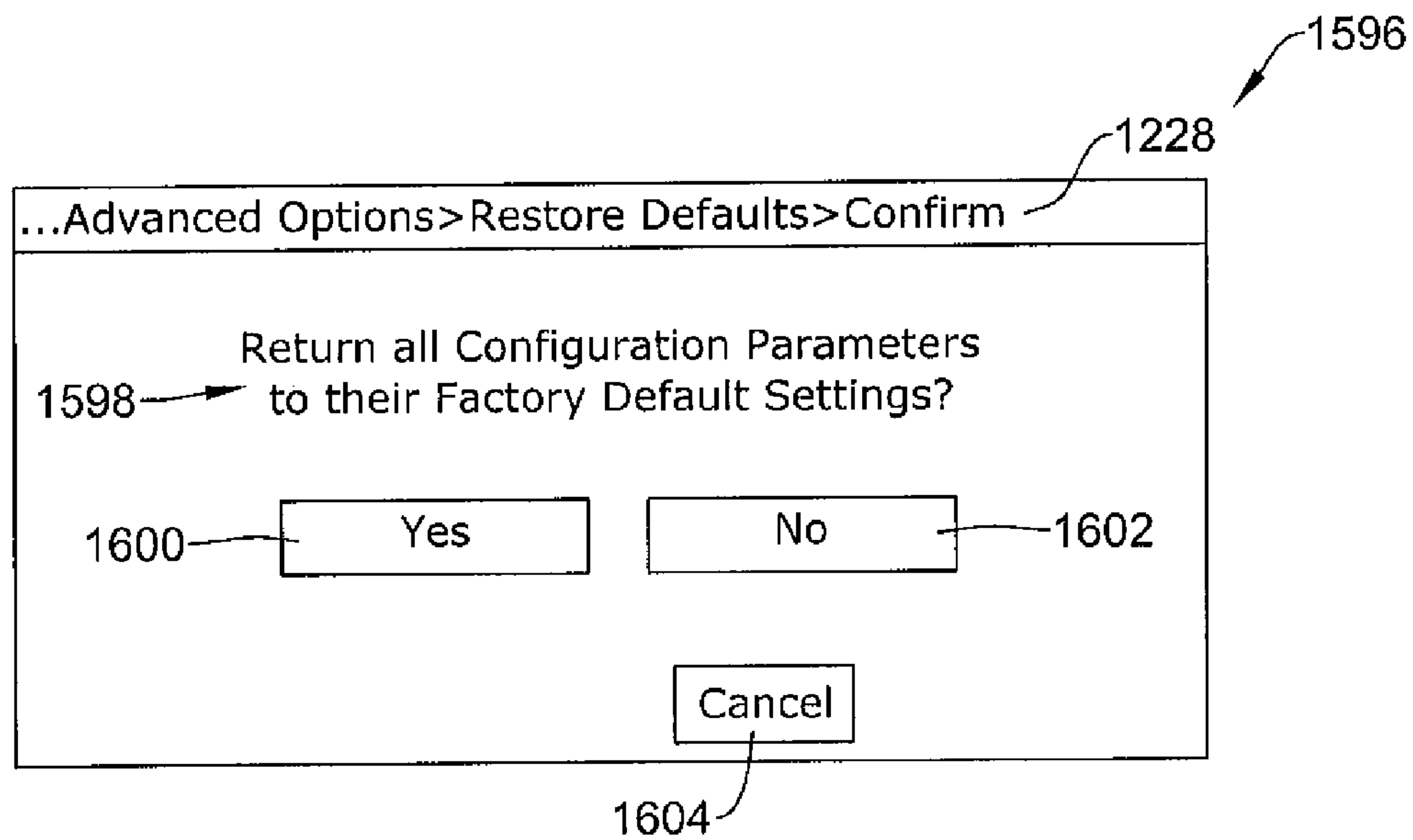


Figure 178

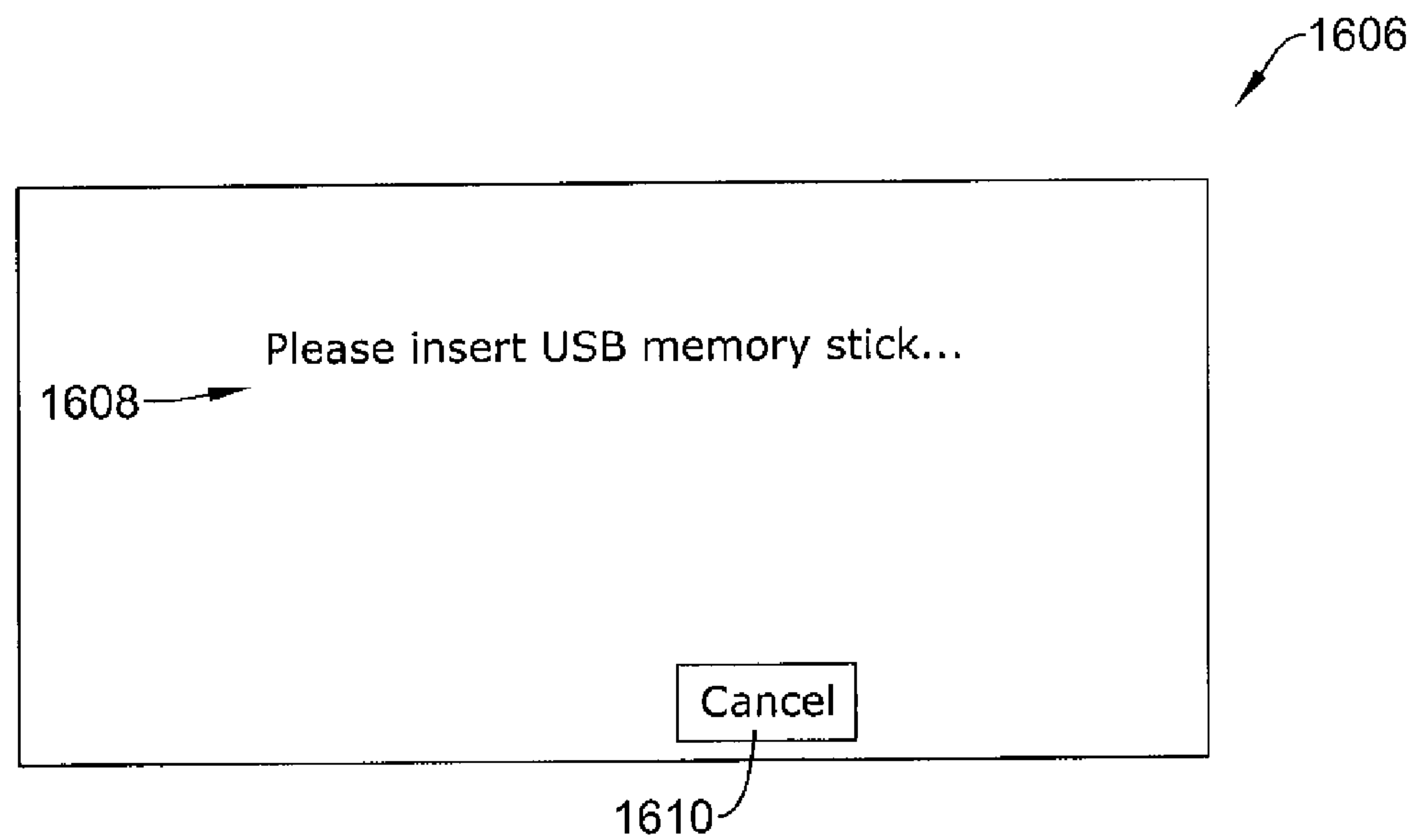
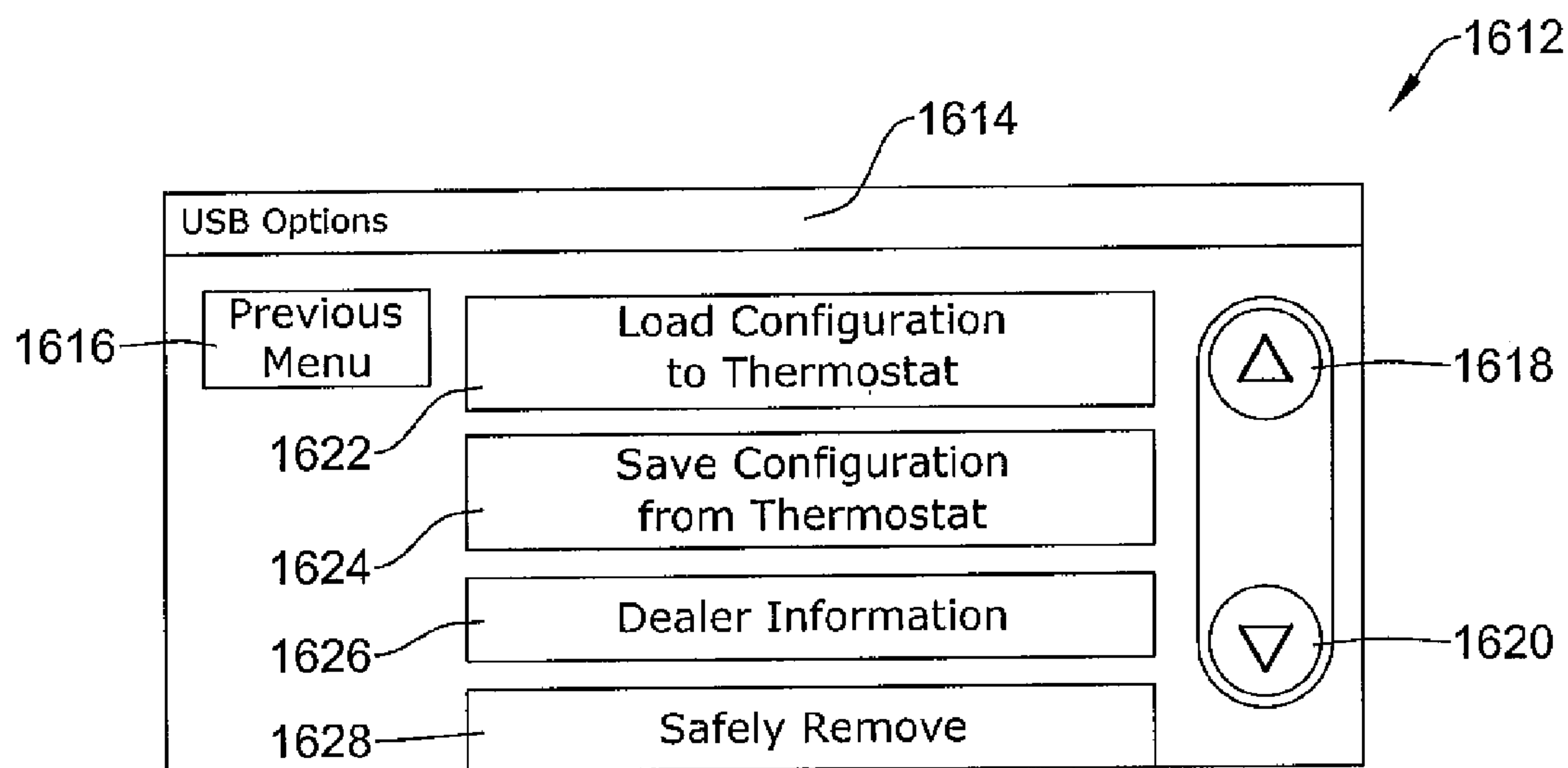
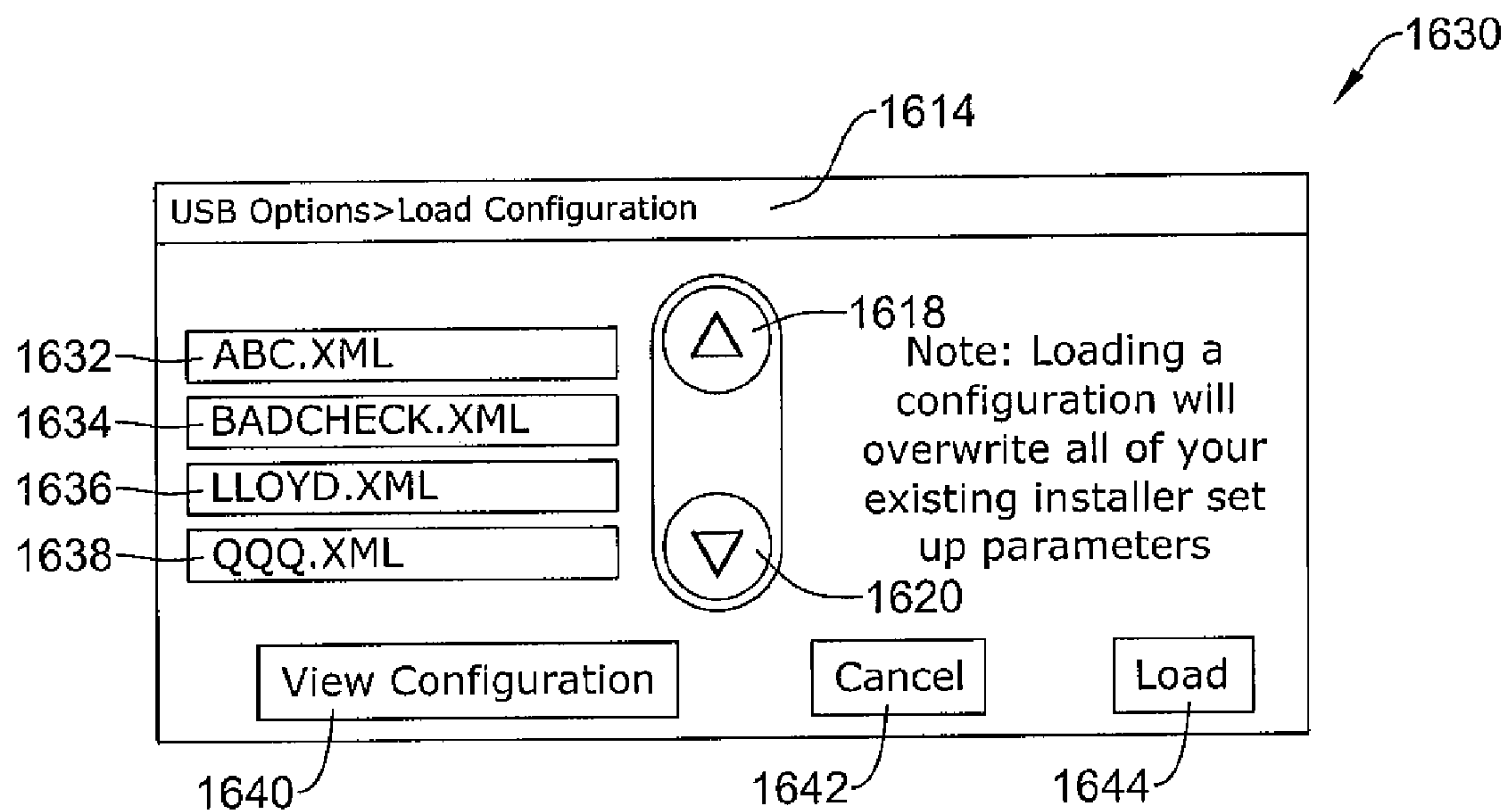


Figure 179

*Figure 180**Figure 181*

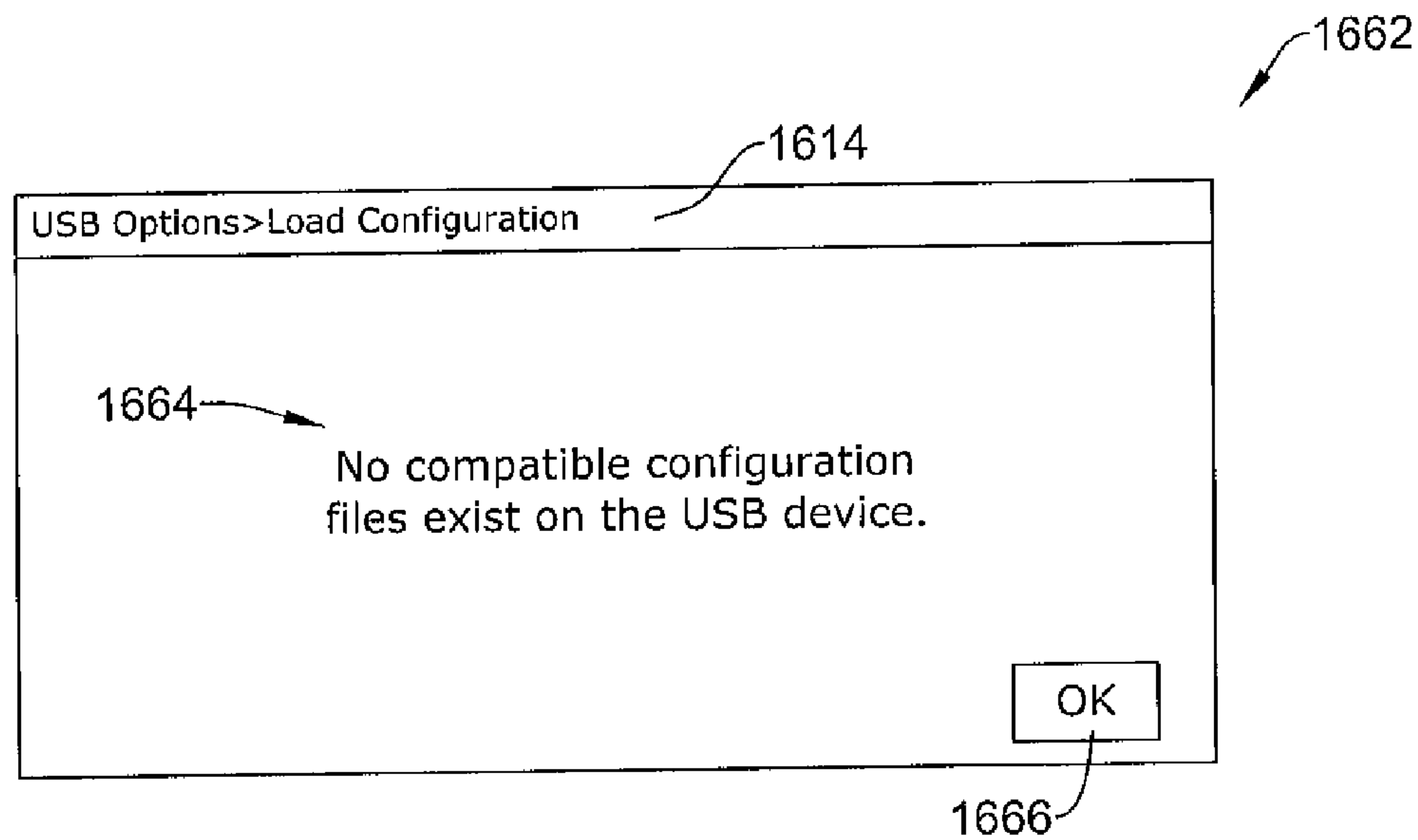


Figure 182

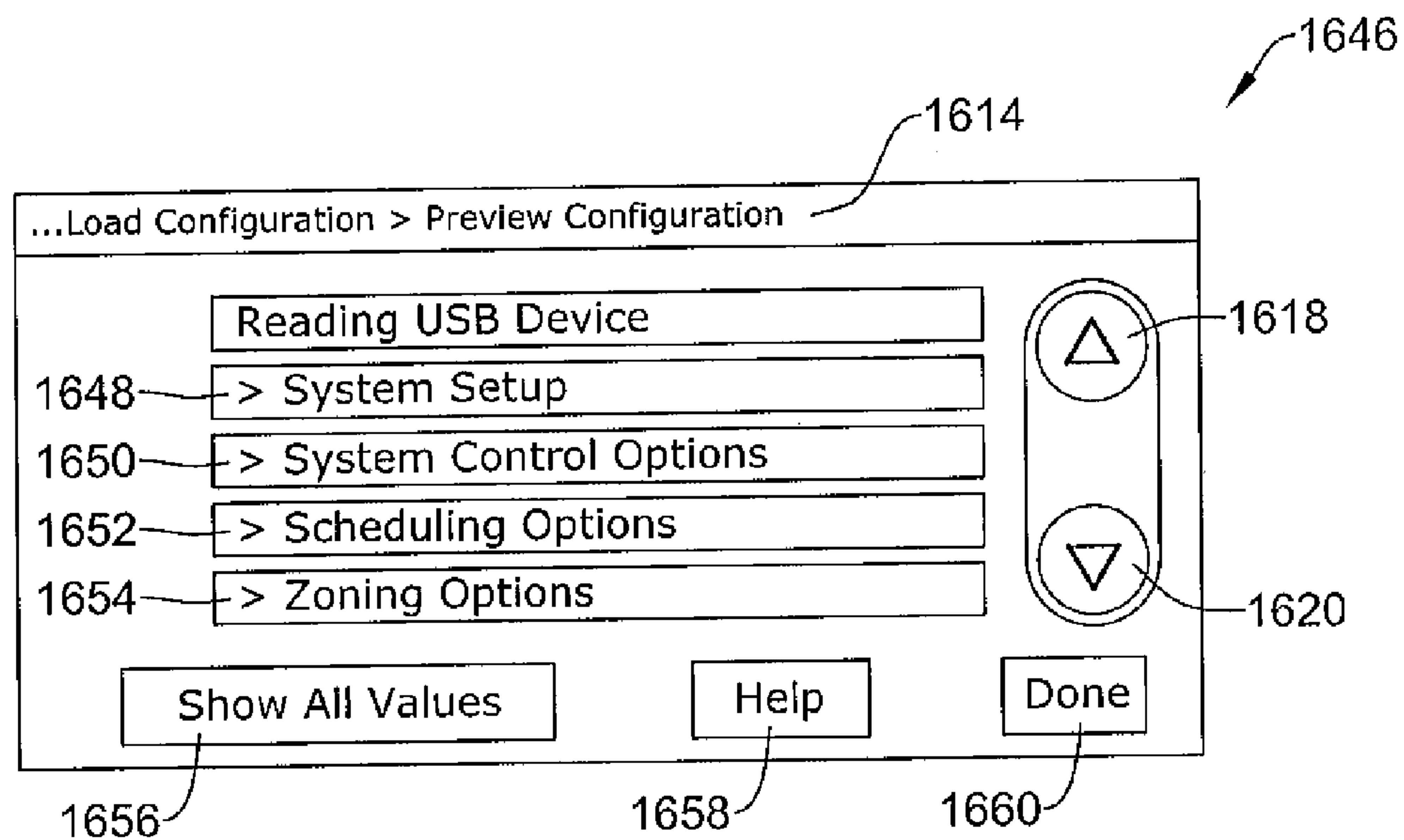
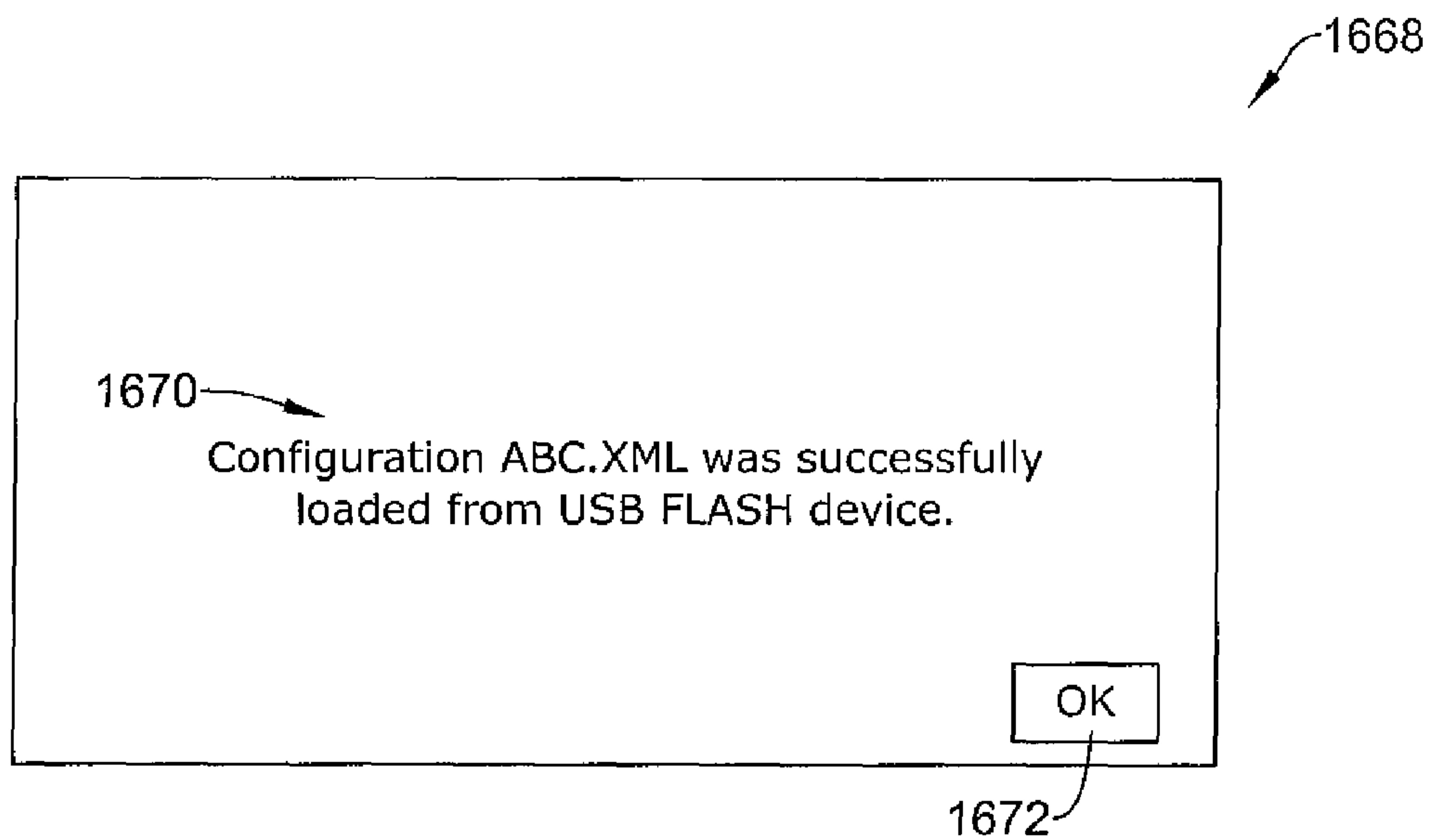
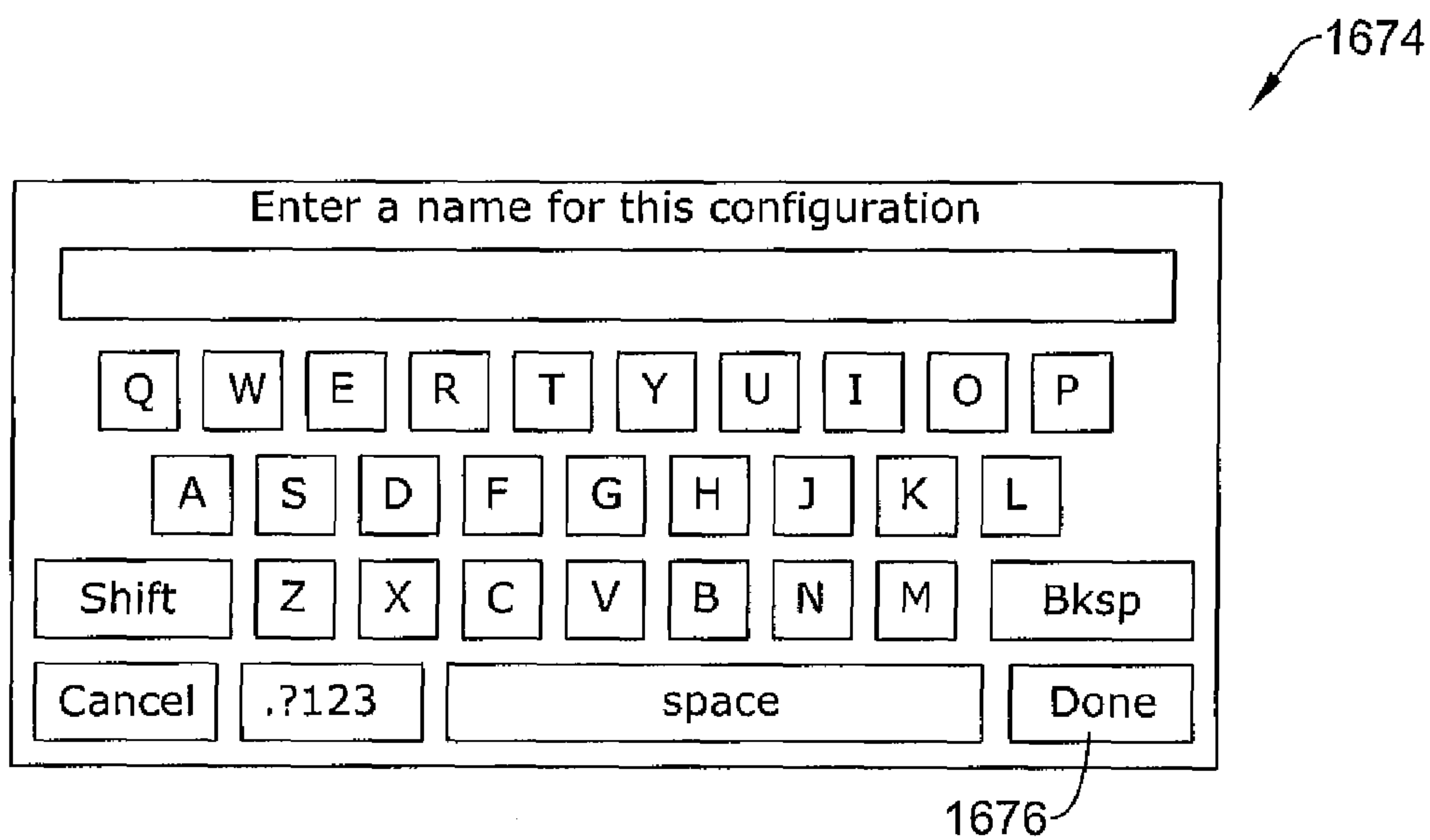
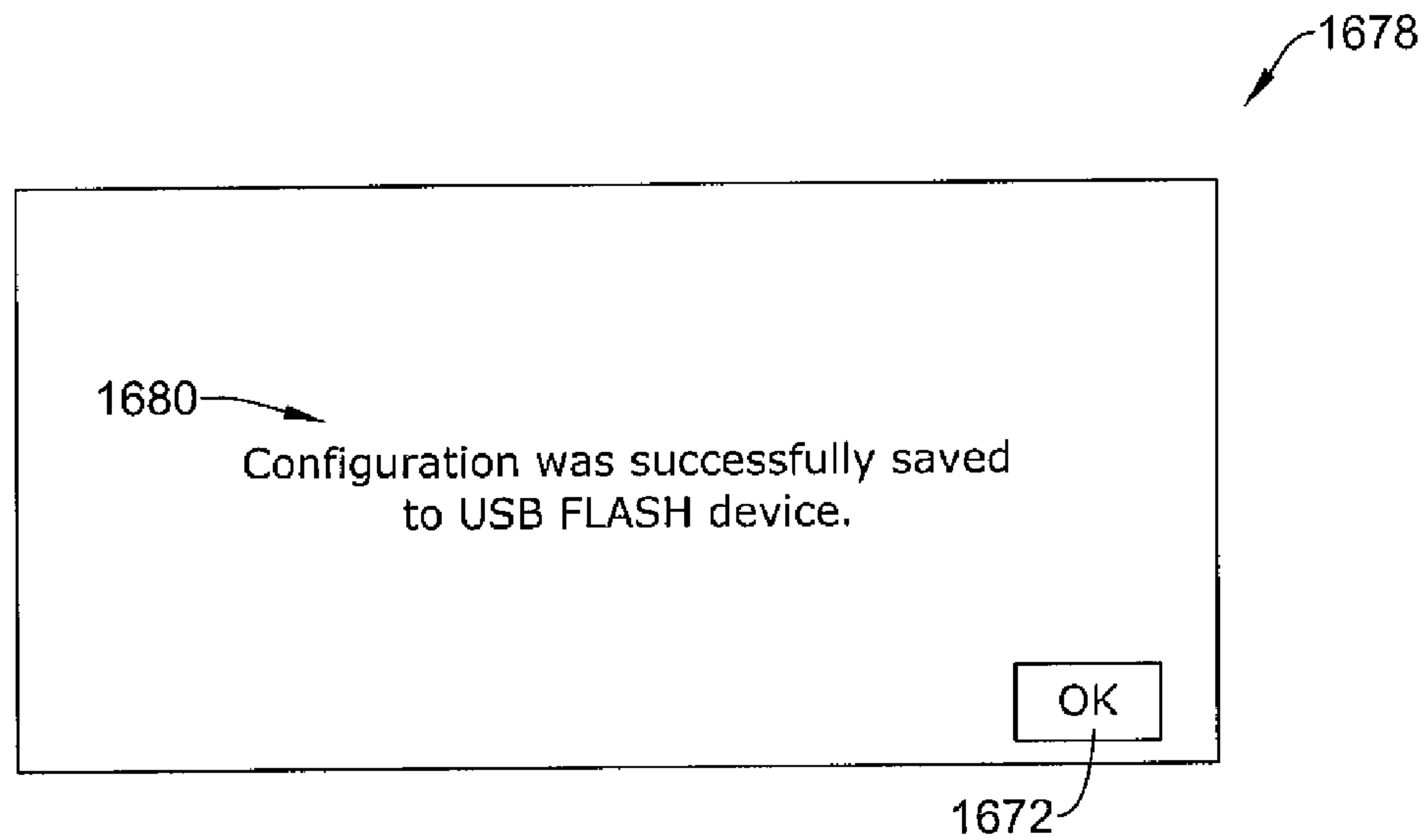
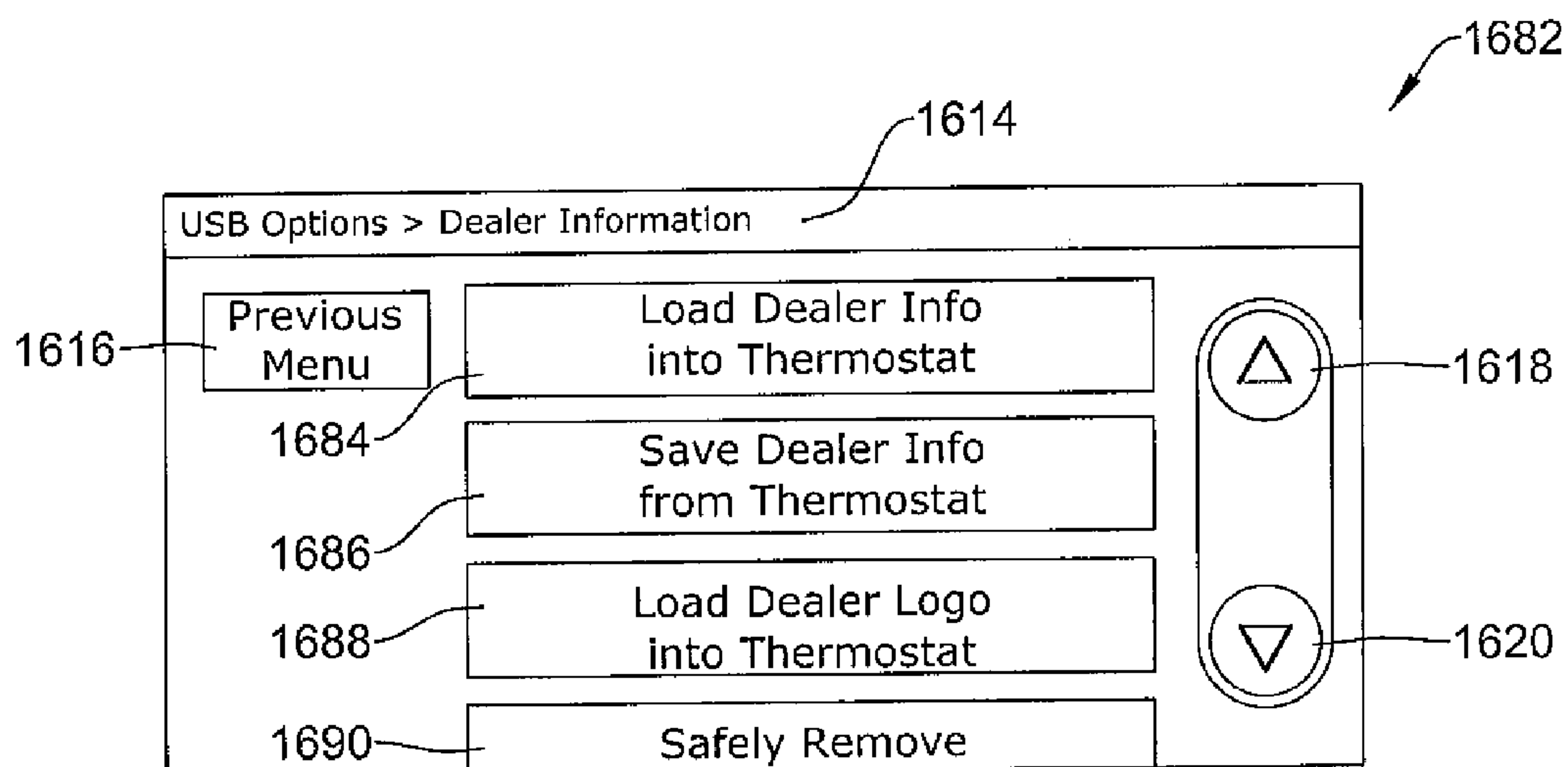
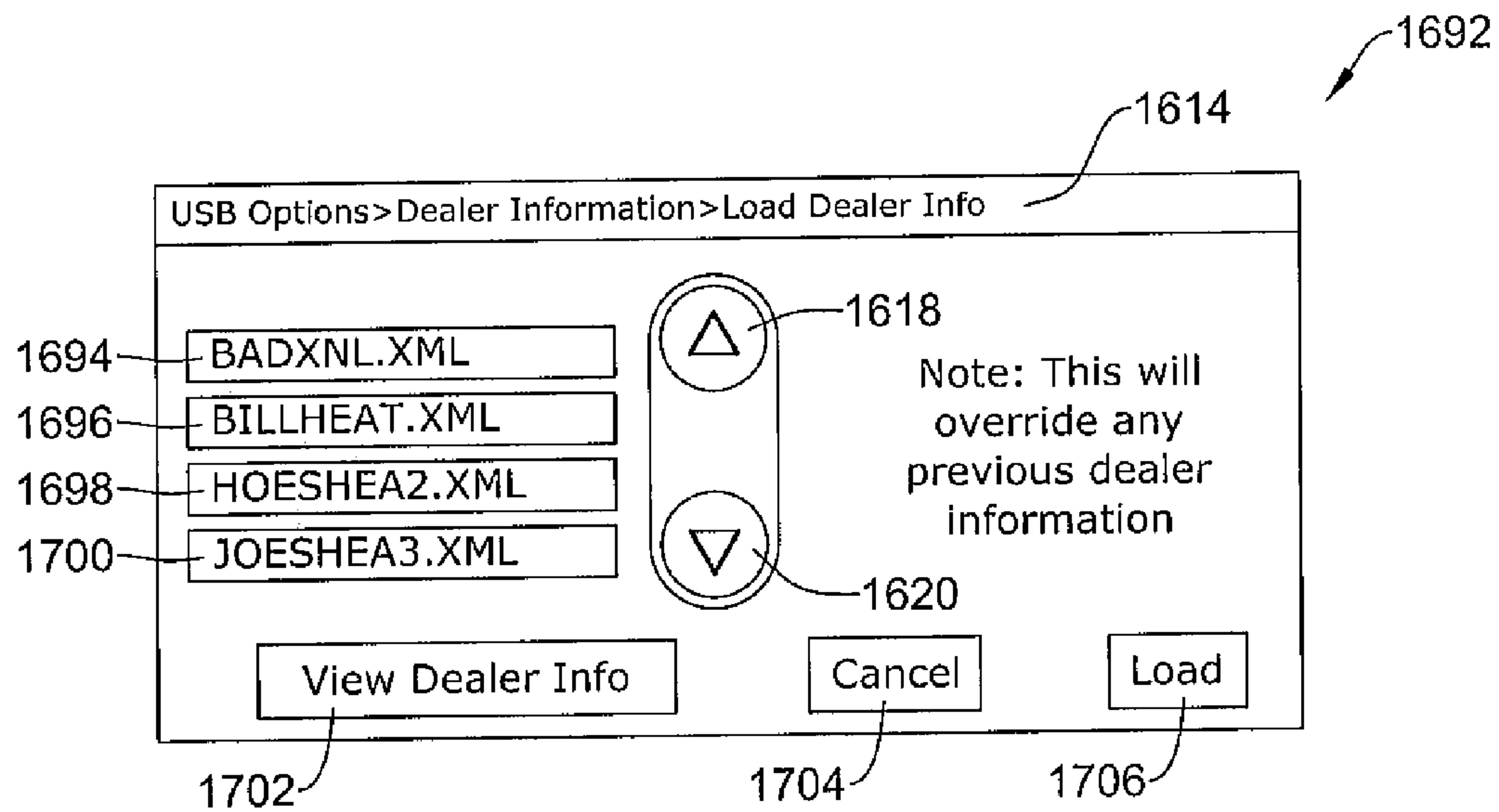
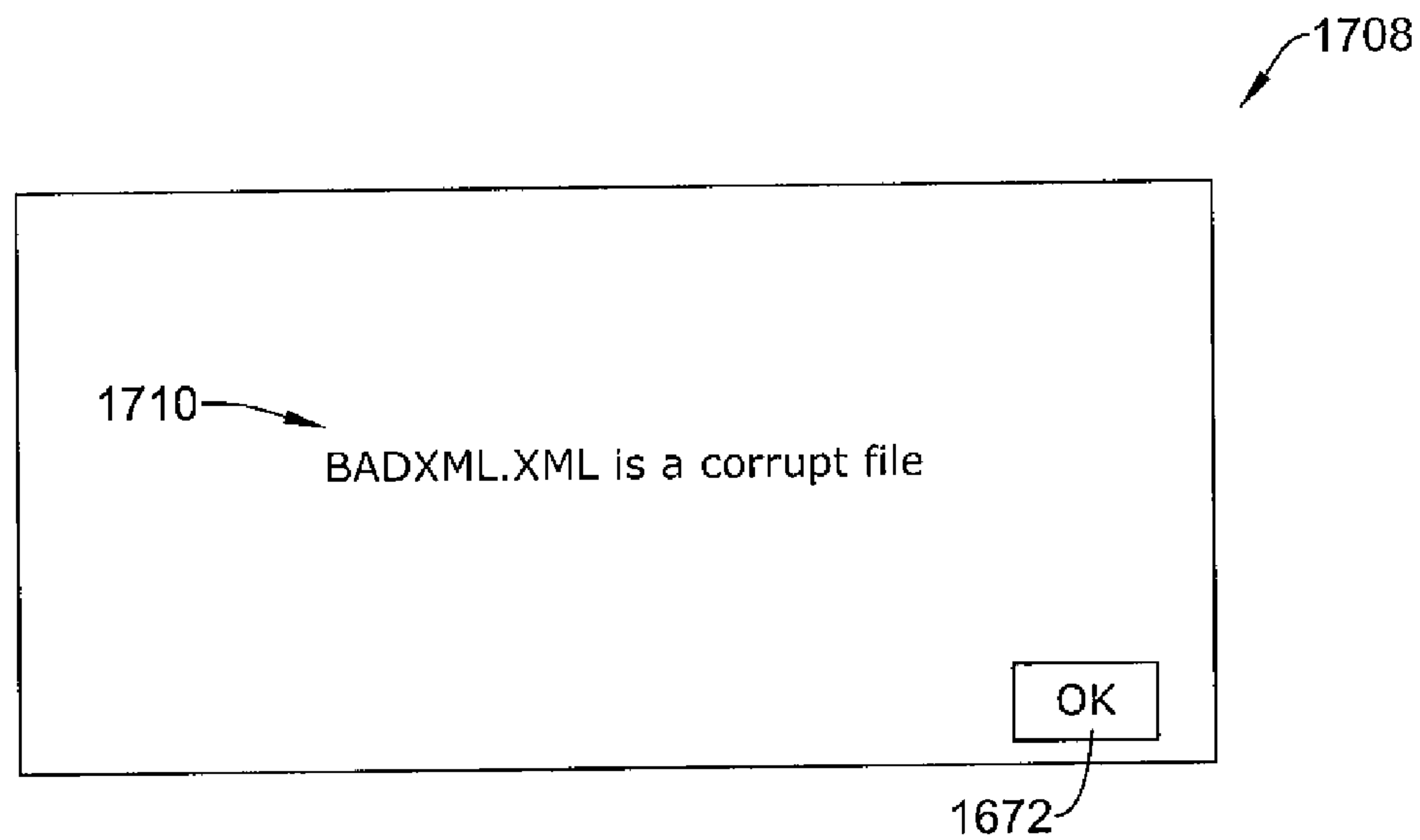
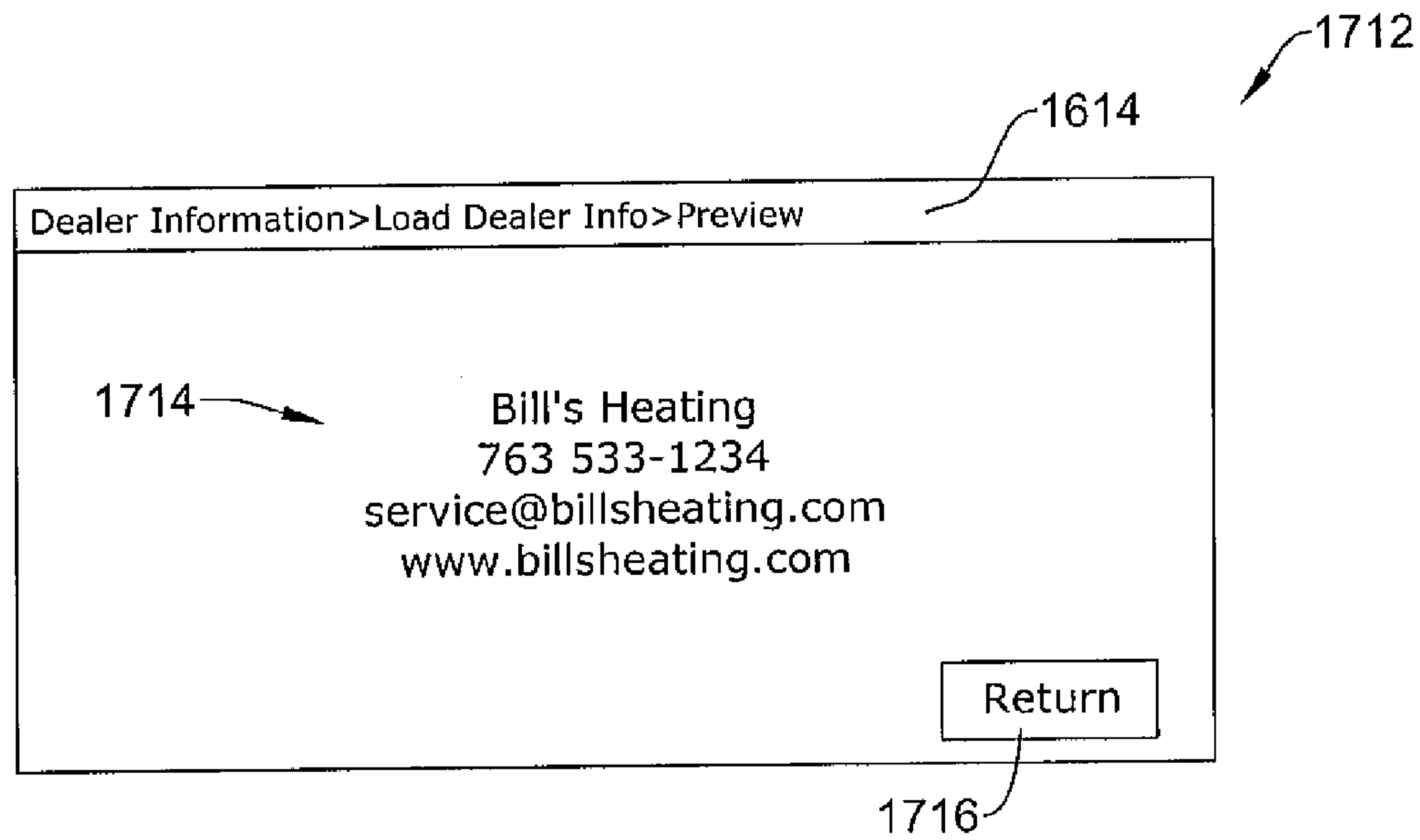
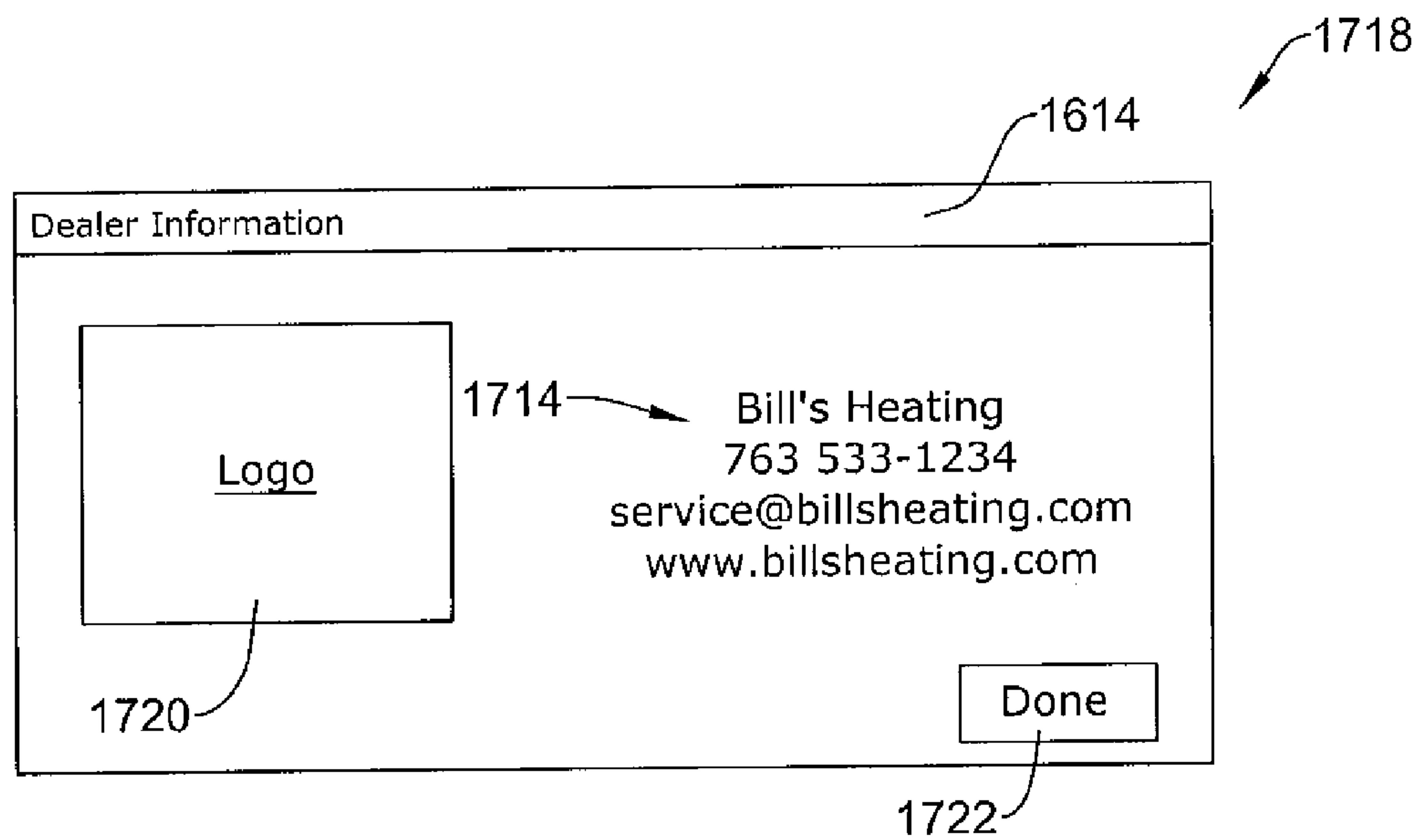


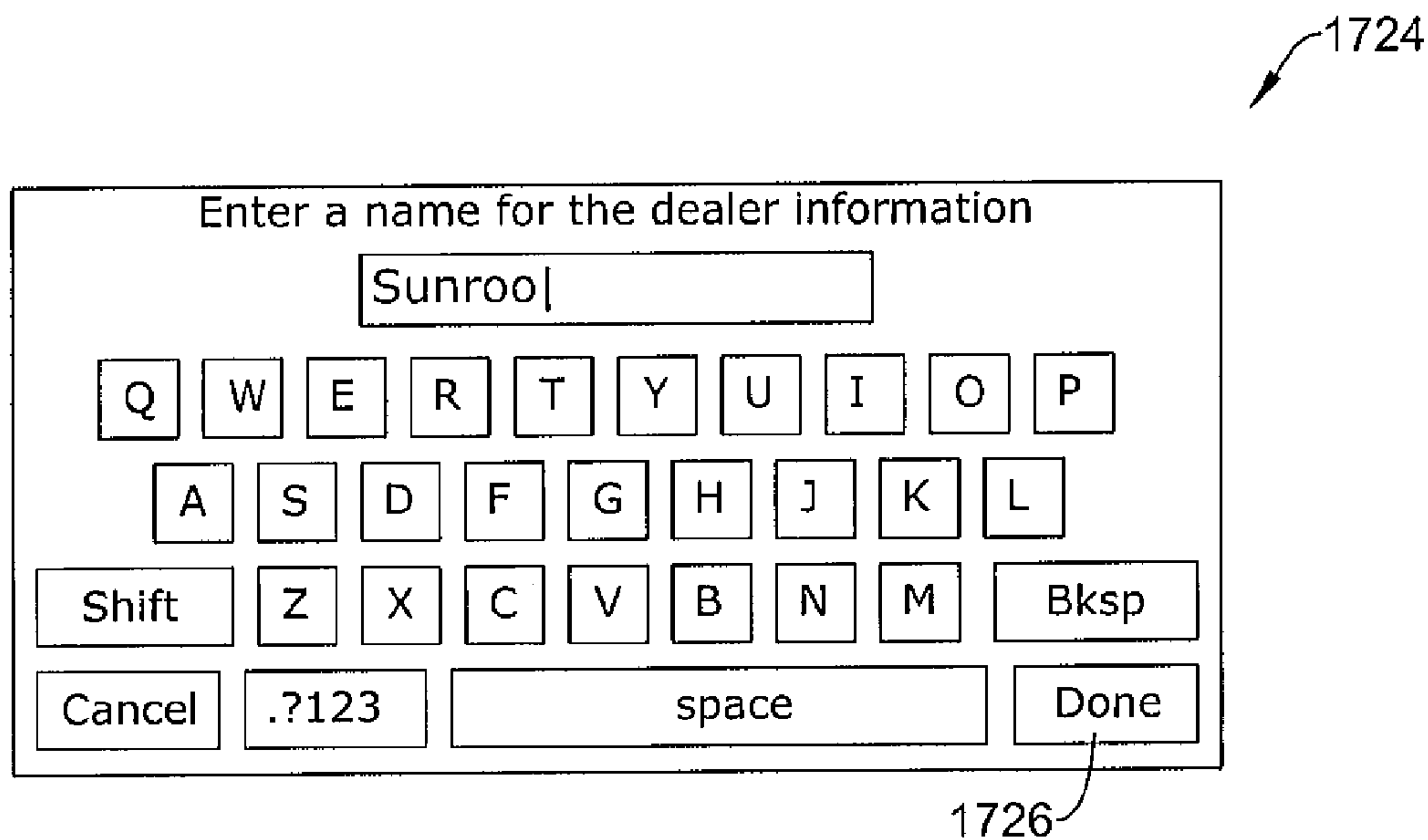
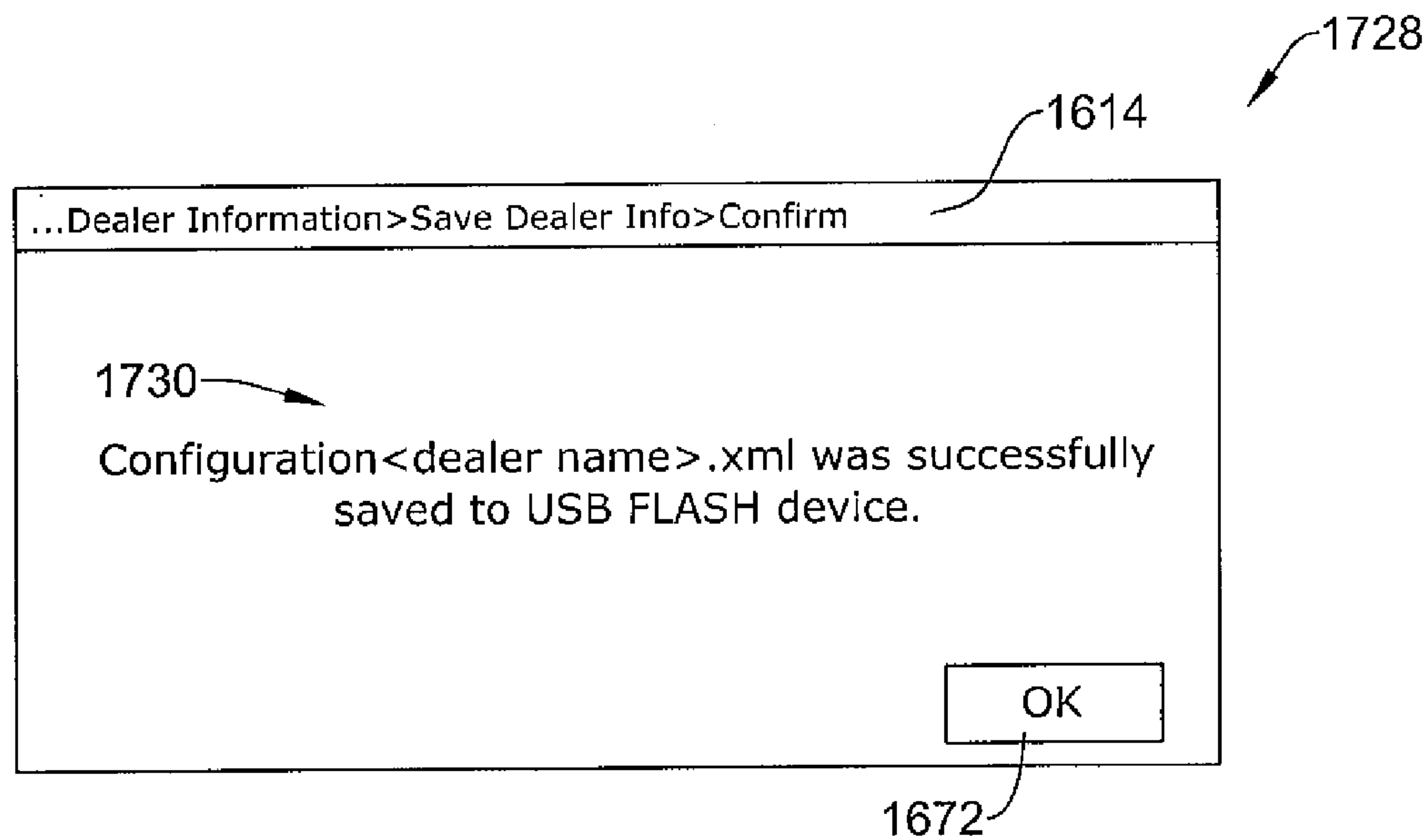
Figure 183

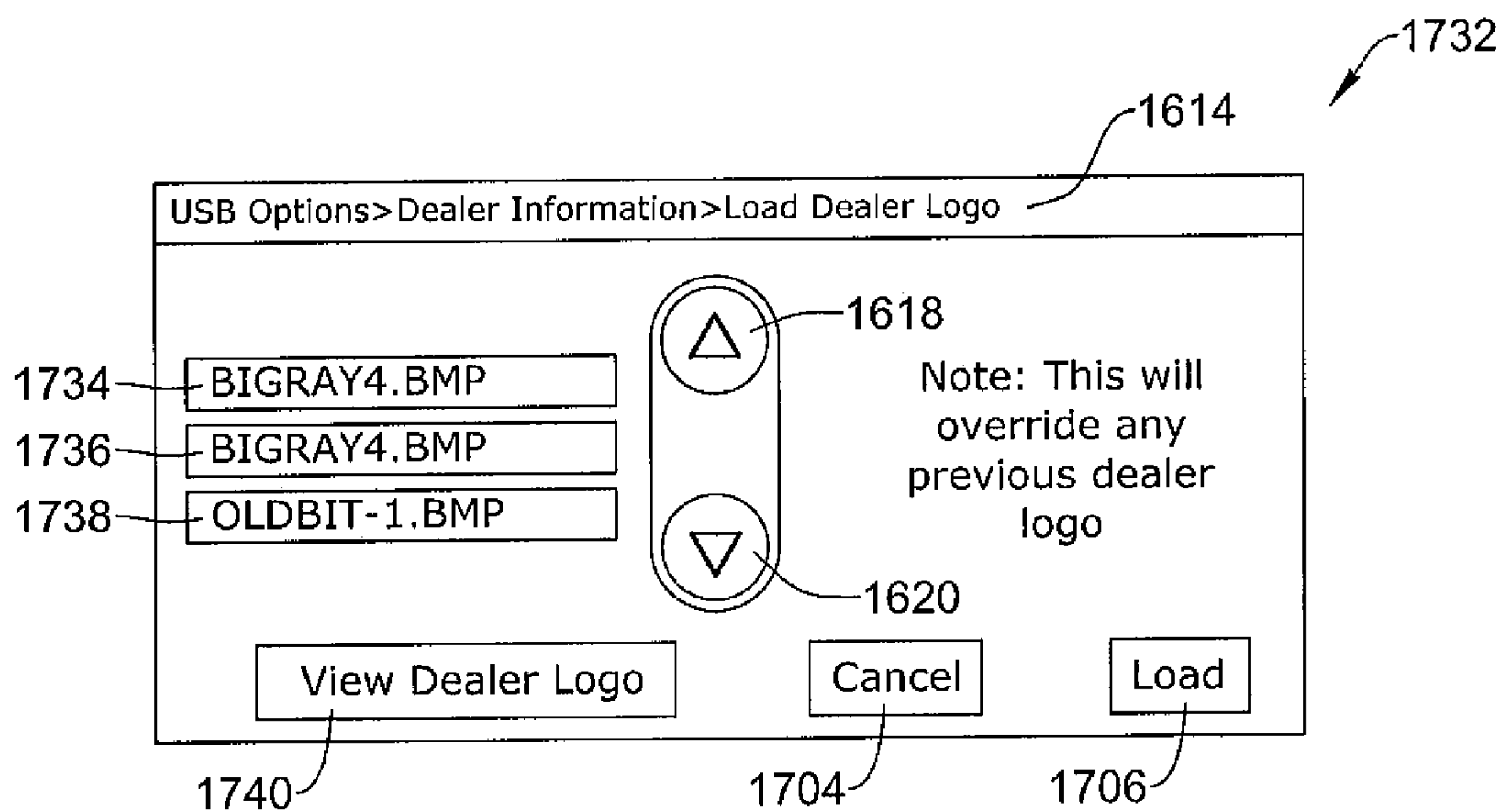
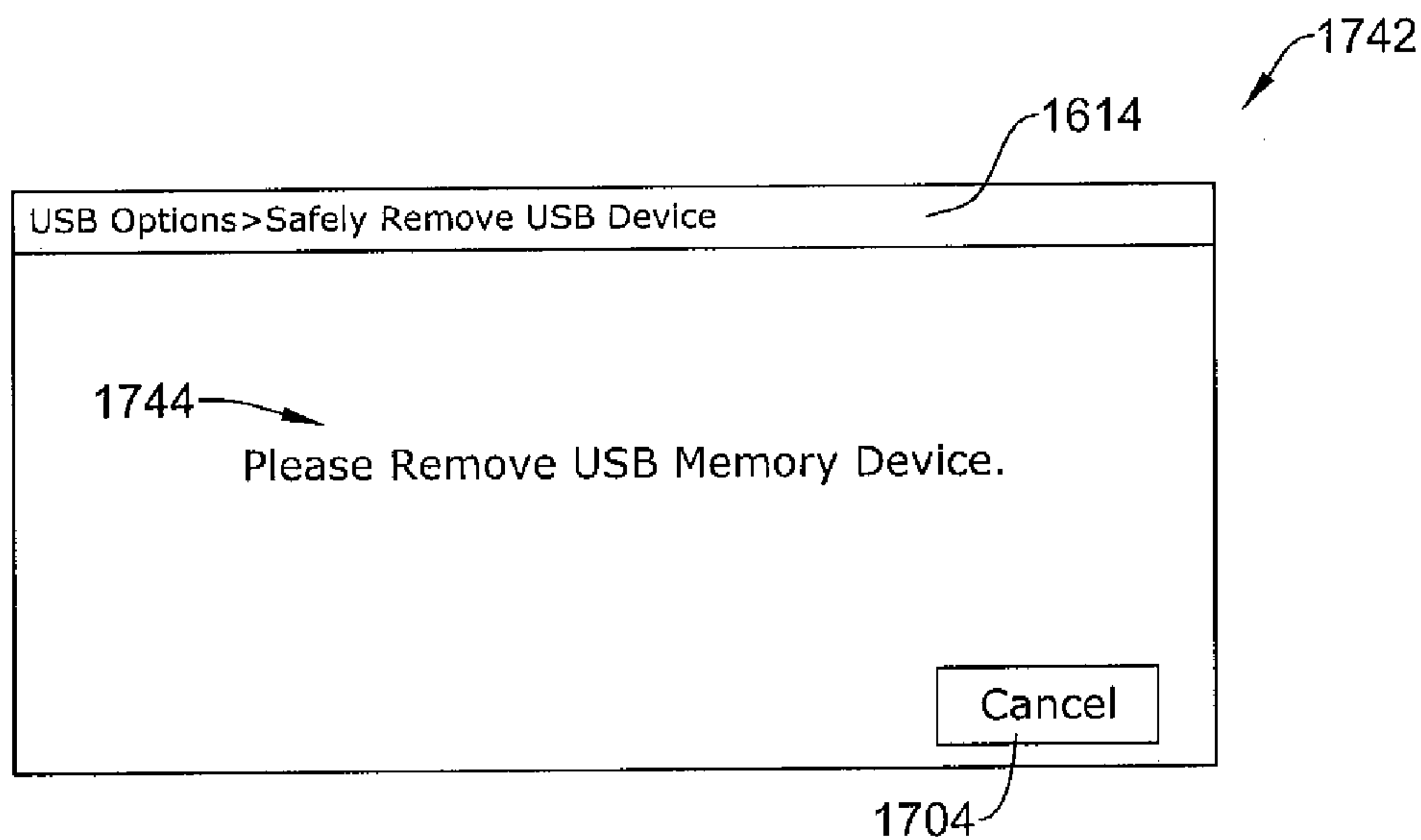
*Figure 184**Figure 185*

*Figure 186**Figure 187*

*Figure 188**Figure 189*

*Figure 190**Figure 191*

*Figure 192**Figure 193*

*Figure 194**Figure 195*

1

HVAC CONTROLLER THAT SELECTIVELY REPLACES OPERATING INFORMATION ON A DISPLAY WITH SYSTEM STATUS INFORMATION

This is a continuation of co-pending U.S. patent application Ser. No. 12/323,179, filed Nov. 25, 2008, and entitled "HVAC CONTROLLER THAT SELECTIVELY REPLACES OPERATING INFORMATION ON A DISPLAY WITH SYSTEM STATUS INFORMATION", which claims priority under 35 U.S.C. §119 to U.S. Provisional Application having Ser. No. 60/991,626 entitled "HVAC CONTROLLER" filed Nov. 30, 2007, both of which are incorporated herein by reference.

TECHNICAL FIELD

The disclosure relates generally to HVAC controllers.

BACKGROUND

Heating, ventilation, and/or air conditioning (HVAC) systems are often used to control the comfort level within a building or other structure. Many HVAC controllers include a controller that activates and deactivates one or more HVAC components of the HVAC system to affect and control one or more environmental conditions within the building. These environmental conditions can include, but are not limited to, temperature, humidity, and/or ventilation. In many cases, such HVAC controller may include, or have access to, one or more sensors, and may use parameters provided by the one or more sensors to control the one or more HVAC components to achieve desired programmed or set environmental conditions. Because of the increased complexity of such modern HVAC controllers, programming and/or operating such devices can be considered difficult and/or confusing, particularly for novice and/or non-technical users. Thus, there is a need for HVAC controllers that are more intuitive and user friendly to program and operate.

SUMMARY

This disclosure relates to HVAC controllers that are configured to be more intuitive and user friendly to program and operate. In some instances, the disclosure relates to HVAC controllers that include a touch screen interface that provides greater flexibility in displaying information to the user and/or soliciting information from the user, although this is not required.

The above summary is not intended to describe each and every disclosed embodiment or every implementation of the disclosure. The Description that follows more particularly exemplifies the various illustrative embodiments.

BRIEF DESCRIPTION OF THE FIGURES

The following description should be read with reference to the drawings, in which like elements in different drawings are numbered in like fashion. The drawings, which are not necessarily to scale, depict selected embodiments and are not intended to limit the scope of the disclosure. The disclosure may be more completely understood in consideration of the following detailed description of various embodiments in connection with the accompanying drawings, in which:

FIG. 1 is a schematic view of an illustrative but non-limiting HVAC controller;

2

FIG. 2 is a front view of an illustrative but non-limiting HVAC controller;

FIGS. 3 through 17 provide illustrative but non-limiting examples of home screens that may be displayed upon the HVAC controllers of FIGS. 1 and 2;

FIGS. 18 through 46 provide illustrative but non-limiting examples of screens pertaining to creating and/or editing a schedule using the HVAC controllers of FIGS. 1 and 2;

FIGS. 47 through 53 provide illustrative but non-limiting examples of screens pertaining to creating and/or editing a vacation schedule using the HVAC controllers of FIGS. 1 and 2;

FIGS. 54 through 60 provide illustrative but non-limiting examples of screens pertaining to changing and/or viewing humidification and dehumidification settings using the HVAC controllers of FIGS. 1 and 2;

FIGS. 61 through 66 provide illustrative but non-limiting examples of screens pertaining to changing and/or viewing ventilation settings using the HVAC controllers of FIGS. 1 and 2;

FIGS. 67 through 69 provide illustrative but non-limiting examples of screens pertaining to setting system information using the HVAC controllers of FIGS. 1 and 2;

FIGS. 70 through 72 provide illustrative but non-limiting examples of screens pertaining to changing and/or viewing date and time settings using the HVAC controllers of FIGS. 1 and 2;

FIGS. 73 through 95 provide illustrative but non-limiting examples of screens pertaining to changing and/or viewing preferences information using the HVAC controllers of FIGS. 1 and 2;

FIGS. 96 through 112 provide illustrative but non-limiting examples of screens pertaining to temporary schedule changes using the HVAC controllers of FIGS. 1 and 2;

FIGS. 113 through 114 provide illustrative but non-limiting examples of screens pertaining to fan scheduling using the HVAC controllers of FIGS. 1 and 2;

FIG. 115 provides an illustrative but non-limiting example of a screen pertaining to locating a remote control using the HVAC controllers of FIGS. 1 and 2;

FIGS. 116 through 117 provide illustrative but non-limiting examples of screens pertaining to screen cleaning using the HVAC controllers of FIGS. 1 and 2;

FIGS. 118 through 123 provide illustrative but non-limiting examples of screens pertaining to changing and/or viewing security settings using the HVAC controllers of FIGS. 1 and 2; and

FIGS. 124 through 195 provide illustrative but non-limiting examples of screens pertaining to installer setup of the HVAC controllers of FIGS. 1 and 2.

While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention.

DESCRIPTION

Generally, the disclosure pertains to simplified interfaces for controllers having programming capabilities. These controllers can be used in a variety of systems such as, for example, HVAC systems, water heater systems, water softener systems, sprinkler systems, security systems, lighting systems, and the like. The Figures depict HVAC controllers.

While the present invention is not so limited, an appreciation of various aspects of the invention will be gained through a discussion of the examples provided below.

FIG. 1 is a schematic view of an illustrative HVAC controller 10. In some cases, HVAC controller 10 may be considered to be a thermostat, but this is not required. HVAC controller 10 includes a processor or controller 12 and a user interface 14. Controller 12 may be adapted to operate in accordance with an algorithm that controls or at least partially controls one or more components of an HVAC system. In some instances, the algorithm may include a number of operating parameters. Examples of components that may be controlled by controller 12 include one or more of a furnace, a boiler for hot water heat or steam heat, a heat pump, an air conditioning unit, a humidifier, a dehumidifier, an air exchanger, an air cleaner, and the like. Controller 12 may, for example, operate in accordance with an algorithm that provides temperature set points, starting and/or ending times, and the like.

User interface 14 may be any suitable interface that permits controller 12 to display and/or solicit information as well as permitting a user to enter data such as temperature set points, humidity set points, starting times, ending times, and the like. In some cases, user interface 14 may include a display and a distinct keypad. A display may be any suitable alphanumeric display. In some instances, a display may include or may be a liquid crystal display (LCD). If desired, user interface 14 may be a touch screen LCD panel that functions as both display and keypad. In some instances, a touch screen LCD panel may be adapted to solicit values for a number of operating parameters and/or to receive said values.

HVAC controller 10 may include a memory block 16 that may be considered as being electrically connected to controller 12. Memory block 16 may be used to store any desired information, such as the aforementioned control algorithm, set points, and the like. Controller 12 may store information within memory block 16 and may subsequently retrieve the stored information. Memory block 16 may be any suitable type of storage device, such as RAM, ROM, EPROM, a flash drive, a hard drive, and the like.

In some cases, as illustrated, HVAC controller 10 may include a data port 18. Data port 18 may be configured to communicate with controller 12 and may, if desired, be used to either upload information to controller 12 or to download information from controller 12. Information that can be uploaded or downloaded may include values of operating parameters. In some instances, data port 18 may be used to upload a previously-created thermostat configuration into HVAC controller 10, thereby hastening the programming process. In some cases, data port 18 may be used to download a thermostat configuration that has been created using HVAC controller 10, so that the thermostat configuration may be used in other thermostats. In some cases, data port 18 may be used to upload and/or download information pertaining to an HVAC dealer or contractor.

Data port 18 may be a wireless port such as a Bluetooth™ port or any other wireless protocol. In some cases, data port 18 may be a wired port such as a serial port, a parallel port, a CATS port, a USB (universal serial bus) port, or the like. In some instances, data port 18 may be a USB port and may be used to download and/or upload information from a USB flash drive. Other storage devices may also be employed, as desired.

FIG. 2 is a front view of an illustrative HVAC controller 20. In some cases, HVAC controller 20 may represent a manifestation of HVAC controller 10 (FIG. 1), but this is not required. HVAC controller 20 includes a display 22 that is disposed

within a housing 24. In some cases, display 22 may be a touch screen LCD display. If desired, display 22 may be a dot matrix touch screen LCD display. A dot matrix touch screen LCD display is a touch screen LCD that permits images such as letters, numbers, graphics, and the like to be displayed anywhere on the LCD, rather than being confined to predetermined locations such as is the case with a fixed segment LCD. Housing 24 may be formed of any suitable material, such as a polymeric material.

In some cases, HVAC controller 20 may be configured to provide substantial display and/or programming functionality. FIGS. 3 through 15 provide examples of home screens that may be displayed by HVAC controller 20. In some cases, home screens may include screens that can be accessed by a top level navigational menu. In some cases, a home screen may be a screen that is displayed by HVAC controller 20 as a default display, or when no other data entry is underway. A home screen may, if desired, display one or more parameters relating to environmental conditions such as indoor and/or outdoor temperature and/or humidity, expected weather conditions, and/or the status of any equipment that is at least partially controlled by HVAC controller 20.

In FIG. 3, HVAC controller 20 is displaying on display 22 a home screen 24 that includes a navigational bar 26 that may be considered as providing top level navigation. In some cases, if desired, navigation bar 26 may include one or more of a HOME button 28, a FAN button 30, a HEAT/COOL button 32 and/or a MENU button 34. The function of each button within navigational bar 26 will be demonstrated, in turn. FIG. 3 is an example of a screen that may be displayed after a user has pushed HOME button 28.

In some cases, home screen 24 may be considered as having two or more regions. For example, home screen 24 may include a first region 36 and a second region 38. In some instances, first region 36 may be considered as displaying or otherwise providing primary information while second region 38 may be considered as displaying or otherwise providing secondary information. In some cases, primary information may be information that is considered to be more important, more interesting and/or more useful than secondary information. To illustrate, first region 36 may display one or more of a current temperature reading, a current indoor humidity, a schedule status, and the like. Second region 38 may display one or more of a date and time, an outdoor temperature reading, an outdoor humidity reading, an equipment status, and the like.

Home screen 24 may also include a third region 40 that may be used for displaying and/or adjusting a parameter value such as a parameter that is displayed within first region 36 of home screen 24. In some cases, for example, third region 40 may include a parameter 42, an up arrow 44 and a down arrow 46. The value of parameter 42 may be increased or decreased using, as necessary, up arrow 44 and/or down arrow 46.

As illustrated, second region 38 may refer to a left-hand section of home screen 24, third region 40 may refer to a right-hand section of home screen 24 and first region 36 may refer to a center section of home screen 24 that is between second region 38 and third region 40. In some instances, however, one or more of first region 36, second region 38 and/or third region 40 may instead be aligned vertically above or below the other regions within home screen 24, as desired.

In FIG. 4, HVAC controller 20 is displaying on display 22 a home screen 48 that is similar in many ways to home screen 24 (FIG. 3). Home screen 48, however, includes a third region 50 that may be used to display and/or adjust two different parameter values. For example, third region 50 may, as illustrated, display both a heating temperature set point and a

5

cooling temperature set point, but this is not required. Third region 50 may include a first parameter 52, a first up arrow 54 and a first down arrow 56. Third region 50 may include a second parameter 58, a second up arrow 60 and a second down arrow 62. First parameter 52 may be adjusted up or down using first up arrow 54 and/or first down arrow 56, as appropriate. Second parameter 58 may be adjusted up or down using second up arrow 60 and/or second down arrow 62, as desired.

In some instances, pressing up arrow 44 and/or down arrow 46 (FIG. 3) may cause HVAC controller 20 to display on display 22 a home screen 64 as shown in FIG. 5. Home screen 64 may, as illustrated, include a hold bar 66 that is displayed along a portion of display 22. Hold bar 66 may include one or more of an adjustable time button 68, a resume schedule button 70, a permanent hold button 72 and a done button 74. The adjustable time button 68 may include an up arrow 76 and a down arrow 78. A user may adjust an ending time for a temperature hold by pressing up arrow 76 and/or down arrow 78, as appropriate. If a user changes their mind, and wishes to instead return to the programmed schedule, they may do so simply by pressing resume schedule button 70. Once they have adjusted the ending time as desired, they may press done button 74.

FIG. 6 is similar to FIG. 5, but includes third region 50 as originally discussed with respect to FIG. 4. FIG. 6 shows a home screen 80 that might be displayed by HVAC controller 20 if a user has pressed or one or more of first up arrow 54, first down arrow 56, second up arrow 60 and/or second down arrow 62 to adjust a temperature set point.

Returning briefly to FIG. 5, if a user presses done button 74, HVAC controller 20 may display on display 22 a home screen 82, as shown in FIG. 7. Home screen 82 may include first region 36, second region 38 and third region 40 as discussed with respect to FIG. 3. However, first region 36 may include a hold status button 84 that displays an ending time for the temporary temperature schedule as well as providing the user with a way to adjust the temporary temperature schedule. If the user had instead pressed permanent hold button 72 (FIG. 5), HVAC controller 22 may instead display a permanent hold status button 86 in place of hold status button 84. In some cases, HVAC controller 20 may permit a user to set a temporary temperature schedule that lasts longer than 24 hours and thus HVAC controller 20 may instead display a hold status button 88 in place of hold status button 84 or permanent hold status button 86.

FIG. 8 is similar to FIG. 7, but includes third region 50 as originally discussed with respect to FIG. 4. FIG. 8 shows a home screen 90 that might be displayed by HVAC controller 20 if a user has pressed or one or more of first up arrow 54, first down arrow 56, second up arrow 60 and/or second down arrow 62 to adjust a temperature set point.

FIG. 9 shows an illustrative home screen 91 that in some ways is similar to home screen 82 (FIG. 7), but accounts for HVAC controller 20 cooperating with a remote control. One such remote control is described in U.S. Provisional Patent Application No. 60/991,674 filed Nov. 30, 2007, entitled "REMOTE CONTROL UNIT FOR HVAC SYSTEM", which application is hereby incorporated by reference herein. In some cases, a remote control may be used to control one or more of a variety of different functions of HVAC controller 20. In some instances, for example, HVAC controller 20 may be configured to either sense ambient temperature at HVAC controller 20 using an internal thermal sensor and/or to use a temperature reading from a thermal sensor that may be present within the remote control.

6

Home screen 91 as illustrated shows that HVAC controller 20 is using a temperature reading from the remote control, as indicated by the text "Sensing from remote" displayed within first region 36 of display 22. An individual may instead wish to instruct HVAC controller 20 to use the internal thermal sensor (or a remote sensor located near HVAC controller 20 and communicating wirelessly therewith). A Sense from Here button 93 provides the individual with the opportunity to instruct HVAC controller 20 to use its internal thermal sensor. In some cases, if HVAC controller 20 is using its own thermal sensor, home screen 91 may include a "Sense from Remote" button (not illustrated) and/or the remote control may include a button that permits the homeowner to instead sense the temperature from the remote. A Vacation button 95, as will be discussed further with respect to subsequent Figures, permits a homeowner to view and/or modify temporary vacation-related scheduling.

In some instances, HVAC controller 20 may display a first image within first region 36 of display 22 and a second image within second region 38. The first image may include a first set of information while the second image may include a second set of information. A third image that may include information pertaining to one or more HVAC system status conditions may temporarily replace the second image otherwise displayed within second region 38. In some instances, the first image, the second image and the third image may all be displayed on a home screen. In some cases, displaying the third image in place of the second image may not impact the display of the first image.

In some cases, the first set of information displayed within first region 36 may include current indoor temperature, a temperature set point, an indoor humidity reading and schedule information. The second information displayed within second region 38 may, for example, include one or more of date, a time, an equipment status and an outdoor weather parameter. HVAC controller 20 may, for example, replace the second image with the third image when HVAC controller 30 detects the occurrence of one or more system status events or conditions.

In some instances, HVAC controller 20 may provide messages such as informational messages, equipment status messages, and the like upon at least part of display 22, particularly if home button 28 has been pressed or otherwise chosen or is automatically displayed after, for example, no user interaction is sensed for a period of time (e.g. thirty seconds). FIG. 10 provides an illustrative home screen 92 that includes an information button 94. As illustrated, information button 94 may be displayed within second region 38 and as such does not interfere or otherwise eliminate any information displayed within first region 36.

Home screen 92 includes third region 40 as discussed with respect to FIGS. 3, 5 and 7.

FIG. 11 provides a home screen 96 that includes information button 94 displayed within second region 38, but includes third region 50 as discussed previously with respect to FIGS. 4, 6 and 8. In either case, pressing information button 94 may cause HVAC controller 20 to display further information pertaining to the shorter message displayed within information button 94.

Information button 94 may provide a variety of equipment status messages. An example includes "Your air filter needs to be replaced." Other examples may pertain to humidifier pad replacement, UV light replacement, and other furnace and/or A/C service schedules as appropriate, depending on installed equipment options. FIGS. 10 and 11 show information button 94 displaying the aforementioned message regarding air filter replacement. In some cases, pressing information button 94

(either in FIG. 10 or FIG. 11) will cause HVAC controller 20 to display a screen 100, as shown in FIG. 12.

In FIG. 12, screen 100 includes further information pertaining to the equipment status message included on information button 94. Screen 100 includes text 102 that provides the homeowner with information regarding what needs to be done and/or how to do it. As illustrated, text 102 says “Your system’s (equipment name) (e.g. air filter) needs to be replaced. When you have replaced it, please press Reset.” HVAC controller 20 may fill in the appropriate equipment name, and sometimes provide the appropriate model number and/or appropriate information. The appropriate equipment name, model number and/or other information may reference a current value of a variable that is embedded within the information message, if desired.

Screen 100 includes a Reset button 104, which may be pressed once the appropriate equipment has in fact been replaced. In some cases, home screen 100 may include a Reminder button 106 that provides the homeowner with a period of time sufficient to address the particular issue. For example, Reminder button 106 may temporarily satisfy HVAC controller 20 for a period of time long enough for the homeowner to go to the store and buy the appropriate replacement item such as a new air filter, a new humidifier pad, or the like.

In some cases, home screen 100 may also include a Dealer button 108. When HVAC controller 20 is initially installed, the installer may, if desired and as will be discussed with respect to subsequent Figures, enter information identifying the HVAC contractor. By pressing Dealer button 108, the homeowner may, for example, be provided with a telephone number or email address for the HVAC contractor and thus the homeowner may simply call the HVAC contractor either to order the appropriate replacement item and/or to request that the contractor resolve the issue by obtaining and installing the appropriate replacement item.

In some cases, a “Service Request” button may be provided that sends a message to the identified contractor and requests the contractor to address the issue. HVAC controller 20 may contact the contractor by email message, text message, or the like. The message may, for example, include appropriate part numbers or other diagnostic information so that the contractor can bring the appropriate parts and/or equipment. Of course, HVAC controller 20 would have to be provided with telephone or other Internet access in order to provide this functionality.

In some cases, HVAC controller 20 may have more than one message to display. In these instances, information button 94 may instead display a message such as “There are multiple messages.” or something to that effect. In some cases, screen 100 may include a scroll bar 110 or the like that provides information pertaining to how many messages are waiting as well as providing scroll buttons 112 and 114 so that the homeowner or HVAC contractor may scroll through the messages. If there is only one message to display, scroll bar 110 may not be displayed.

In some instances, and as illustrated with respect to subsequent Figures, HVAC controller 20 may display a help button that, if pressed, may cause HVAC controller 20 to display one or more context sensitive help screens that may provide the user with information that is pertinent to one or more displayed operating parameters. In some cases, the help screen may temporarily replace whatever information was being displayed. The help screens, if displayed, may include information pertaining to, for example, operating parameters such as circulating fan operation, system operation, scheduling, humidification and/or dehumidification settings, ventilation

settings, maintenance reminders, equipment settings, and the like. In some cases, the help screen may include current values of one or more variables embedded within the help screen message, if desired. The information that is displayed may be context sensitive or dependent upon the operating and/or programming steps that are currently being undertaken by the user.

FIG. 13 provides an illustrative home screen 116 that may be displayed if Fan button 30 is pressed. In some cases, a Help button 118 may be displayed within second region 38. By pressing Help button 118, a homeowner or other individual may obtain additional information regarding the choices they are being asked to make. First region 36 may include one or more fan buttons that can be pressed to instruct HVAC controller 20 how to operate the fan present within the HVAC equipment. The fan buttons may include, for example, one or more of a Run Continuously button 120, an Automatic button 122, an Intermittent button 124 and/or a Run Fan with Schedule button 126. As there may be more fan buttons than can be displayed at one time within first region 36, third region 40 may include an up scroll button 128 and a down scroll button 130 in order to scroll through the available fan buttons.

FIG. 14 provides an illustrative help screen 132 that may be provided by HVAC controller 20 if a homeowner or other individual presses Help button 118 within home screen 116 (FIG. 13). Second region 38 may include a Back button 133 that permits an individual to return to the previous screen (e.g. FIG. 13) once they have read and understood the information provided within help screen 132. First region 36 includes textual information providing the individual with information pertaining to the fan choices presented within home screen 116. Third region 40 includes up scroll button 128 and down scroll button 130 in order to scroll up and down through the text provided within first region 36, if necessary.

FIG. 15 provides an illustrative home screen 134 that may be displayed if Heat/Cool button 32 is pressed. In some cases, a Help button 136 may be displayed within second region 38. By pressing Help button 136, a homeowner or other individual may obtain additional information regarding the choices they are being asked to make. First region 36 may include one or more selection buttons that can be pressed to instruct HVAC controller 20 how to operate the HVAC equipment. The selection buttons may include, for example, one or more of a Heating button 138, a Cooling button 140, an Automatic button 142, an Off button 144 and/or an Emergency Heat button 146. As there may be more selection buttons than can be displayed at one time within second region 38, third region 40 may include an up scroll button 128 and a down scroll button 130 in order to scroll through the available selection buttons.

FIG. 16 provides an illustrative help screen 148 that may be provided by HVAC controller 20 if a homeowner or other individual presses Help button 136 within home screen 134 (FIG. 15). Second region 38 may include a Back button 133 that permits an individual to return to the previous screen (e.g. FIG. 15) once they have read and understood the information provided within help screen 132. First region 36 includes textual information providing the individual with information pertaining to the selection choices presented within home screen 116. Third region 40 includes up scroll button 128 and down scroll button 130 in order to scroll up and down through the displayed text.

FIG. 17 provides an illustrative home screen 150 that may be displayed if Menu button 34 is pressed. HVAC controller 20 may display a variety of menu items within first region 36 and/or within second region 38. Third region 40 may include up scroll button 128 and down scroll button 130 to scroll up

and down the displayed menu items, if necessary. These menu items may permit a homeowner or other individual to set a variety of parameters of HVAC controller 20.

In some cases, home screen 150 may include, for example, one or more of a Create/Edit Schedule button 152, a Vacation Mode button 154, an Humidification button 156, a Dehumidification button 158, a Ventilation button 160, a System Information button 162, a Date/Time button 164, a Preferences button 166, a Temporary Schedule Changes button 168, a Schedule Fan button 170, a Southern Dehumidification Mode button 172, a Find Remote button 174, a Clean Screen button 176, a Security Settings button 178 and/or an Installer Set Up button 180. Subsequent Figures will provide illustrative screens that may be displayed by HVAC controller 20 in response to a homeowner or other individual selecting one or more of these menu items.

FIGS. 18 through 46 provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller 20 pertaining to creating, editing and/or viewing a schedule within HVAC controller 20. In particular, FIG. 18 provides an illustrative screen 182 that may be displayed by HVAC controller 20 in response to someone pressing or otherwise selecting Create/Edit Schedule button 152 (FIG. 16). In some instances, screen 182 provides a user with one or more options as to how they wish to create, edit and/or view a schedule. Screen 182 may include one or more of a View/Edit Current Schedule button 184, a Guide Me Through The Scheduling button 186 and/or an I'll Do It Myself button 188. The functionality of each will be described, in turn. Screen 182 may include a Back button 190 that permits a user to return to a previous screen and/or a Help button 192 that may provide the user with pertinent assistance.

In some cases, pressing View/Edit Current Schedule button 184 may cause HVAC controller 20 to display a screen 194, as shown in FIG. 19. Screen 194 may display time and/or temperature set point information for one or more time periods of one or more days. As illustrated, screen 194 provides heating and cooling temperature set points for the Wake period, the Leave period, the Return period and the Sleep period for weekdays Monday through Friday. In some cases, screen 194 may be considered as including a Wake button 196, a Leave button 198, a Return button 200 and a Sleep button 202. As will be discussed, the heating and/or cooling temperature set points for a particular time period, as well as the starting and/or ending times for a particular time period, may be changed by pressing the appropriate button such as Wake button 196, Leave button 198, Return button 200 and/or Sleep button 202.

In some cases, screen 194 may include a View Individual Day button 204 that permits an individual to view only one day at a time, rather than a group of days. If View Individual Day button 204 is pressed, HVAC controller 20 may display heating and cooling temperature set points for one or more time periods for a single day, and may also display a button (not illustrated) that permits the user to scroll ahead to the next day.

In some instances, as illustrated, screen 194 may include a Next Group of Days button 206. If, for example, the displayed group of days is Monday-Friday, pressing Next Group of Days button 206 may cause HVAC controller 20 to display heating and cooling temperature set points for one or more periods of time for Saturday and/or Sunday. A Done button 208 permits a user to tell HVAC controller 20 that they are done viewing and/or editing the schedule, and HVAC controller 20 may return to a previous screen, if desired. Screen 194 may be considered a schedule review screen because the displayed schedule cannot be changed without touching one

of buttons 196-202. Once one of buttons 196-202 are touched, HVAC controller 20 may be considered to be in an edit mode. This may, for example, help the user to know whether changes are being made to the schedule.

FIG. 20 provides an illustrative screen 210 that may be displayed by HVAC controller 20 if, with reference to screen 194 (FIG. 19), one were to press Wake button 196. Screen 210 may permit a user to change one or more of a start time for the Wake time period, the cooling temperature set point and/or the heating temperature set point for Wake time period. Screen 210 includes a Cancel This Period button 212 that, if pressed, permits the user to return to the previous screen and select a different time period, if desired.

Screen 210 includes a time setting block 214 that may include up and down buttons or other indicia that permit a user to alter the start time displayed within time setting block 214. Screen 210 may include a cooling temperature set point block 216 and/or a heating temperature set point block 218. Each of cooling temperature set point block 216 and heating temperature set point block 218 may include up and down button or other indicia that permit a user to alter the cooling temperature set point and/or the heating temperature set point.

In some instances, screen 210 may include a Help button 220 that may, if pressed, cause HVAC controller 20 to display appropriate information pertaining to instructions, available options, and the like. A Cancel button 222 may permit a user to cancel out of whatever changes they have entered, if any, without saving any changes. A Done button 224 may be pressed to inform HVAC controller 20 that the changes, if any, have been entered and should be saved. In some cases, when Done button 224 is pressed, a message such as "Saving Changes" may be displayed, notifying the user that the changes are being saved.

Returning briefly to FIG. 18, another option for creating, editing and/or viewing a schedule is to press I'll Do It Myself button 188. Pressing this button may cause HVAC controller 20 to display an illustrative screen 226, shown in FIG. 21. Screen 226 includes a Monday button 228, a Tuesday button 230, a Wednesday button 232, a Thursday button 234, a Friday button 236, a Saturday button 238 and a Sunday button 240. One way to select which day or days to view/edit is to press the button or buttons corresponding to the desired days. As illustrated, it can be seen that Monday button 228, Tuesday button 230, Wednesday button 232, Thursday button 234 and Friday button 236 have been pressed.

It will be appreciated that in some instances, there may be a desire to be able to quickly make multiple selections. HVAC controller 20 may, for example, display a first menu that includes one or more quick select touch buttons that may be used to quickly select two or more of a plurality of displayed selection options. In some cases, each of the selection options may have an associated algorithm parameter, and HVAC controller 20 may be configured to permit the user to simultaneously change the associated algorithm parameters for each of the two or more of the plurality of selection options that are selected by pressing one of the one or more quick select touch buttons. In some instances, HVAC controller 20 may display a second menu that permits the user to simultaneously change the associated algorithm parameters for each of the two or more of the plurality of selection options that are selected by pressing one of the one or more quick select touch buttons.

In an illustrative example, HVAC controller 20 may display a first menu that includes a schedule menu, and in this situation each of the plurality of selection options of the schedule menu may correspond to a corresponding day of a week. In some cases, one of the quick select touch buttons may be a WEEKDAY button that, when pressed, selects Monday,

11

Tuesday, Wednesday, Thursday and Friday for scheduling. Another example is a WEEKEND button that, when pressed, selects Saturday and Sunday for scheduling. Another example is an ALL button that, when pressed, selects all days of the week for scheduling.

In some instances, HVAC controller 20 may display a schedule menu, and each of the plurality of selection options of the schedule menu may correspond to a PERIOD of a day of a week. In another example, one of the quick select touch buttons comprises a wake button that, when pressed, selects the wake period for all or selected days of the week. In another example, one of the quick select touch buttons comprises a leave button that, when pressed, selects the leave period for all or selected days of the week. In another example, one of the quick select touch buttons comprises a return button that, when pressed, selects the return period for all or selected days of the week. In another example, one of the quick select touch buttons comprises a sleep button that, when pressed, selects the sleep period for all or selected days of the week.

Returning to the Figures, in some instances, several days may easily be selected using a quick select button such as a Weekdays button 242, a Weekends button 244 and/or an All button 246. Pressing Weekdays button 242 will cause all five week day buttons to be selected. As noted, Monday through Friday are indicated as having been selected. This may be achieved either by pressing each of the five day buttons or by simply pressing Weekdays button 242. Pressing Weekends button 244 may cause Saturday button 238 and Sunday button 240 to be indicated as having been selected. Pressing All button 246 will cause all seven day buttons to be indicated as having been selected. Selected buttons may be indicated, for example, by graphically making each selected button to appear that it has been depressed. In some instances, selected buttons may be indicated in other ways, such as using bolded text, different colors and the like.

In some cases, HVAC controller 20 may include text that helps the user to understand what is expected of them. For example, screen 226 can be seen to include the text “Select the days of the week to schedule”. Messages such as this may help the user navigate through the screens that may be displayed by HVAC controller 20. Screen 226 may include a Cancel button 248 and a Next button 250. Cancel button 248 may be pressed to cancel any changes that have been entered and cause HVAC controller 20 to revert to a previous screen. Next button 250 may be pressed, for example, to move to the next screen.

In some cases, pressing Next button 250 (FIG. 21) causes HVAC controller 20 to display an illustrative screen 252, as shown in FIG. 22. Once the day or days have been selected (as discussed with respect to FIG. 21), the user is given the opportunity to select a time period to edit. Screen 252 includes a Wake button 254, a Leave button 256, a Return button 258 and a Sleep button 260. A Back button 262 permits a user to return to a previous screen such as screen 226 (FIG. 21) to, for example, alter the day or days selected. Again, HVAC controller 20 may display text such as “Please press a time period below to schedule” to assist the user in navigation.

Screen 252 permits the user to edit one or more of the distinct time periods. For example, pressing Wake button 254 may cause HVAC controller 20 to display an illustrative screen 264, as shown in FIG. 23. Screen 264 may permit a user to change one or more of a start time for the Wake time period, the cooling temperature set point and/or the heating temperature set point for Wake time period. Screen 264 includes a Cancel This Period button 266 that, if pressed, permits the user to return to the previous screen and select a

12

different time period, if desired. It can be seen that screen 264 may include helpful text such as “Set your wake time and temperature”.

Screen 264 includes a time setting block 268 that may include up and down buttons or other indicia that permit a user to alter the start time displayed within time setting block 268. Screen 264 may include a cooling temperature set point block 270 and/or a heating temperature set point block 272. Each of cooling temperature set point block 270 and heating temperature set point block 272 may include up and down button or other indicia that permit a user to alter the cooling temperature set point and/or the heating temperature set point.

In some instances, screen 264 may include a Help button 274 that may, if pressed, cause HVAC controller 20 to display appropriate information pertaining to instructions, available options, and the like. A Cancel button 276 may permit a user to cancel out of whatever changes they have entered, if any, without saving any changes and/or return to a previous screen. A Next button 278 may be pressed to indicate to HVAC controller 20 that the displayed time period has been edited as desired. If Next button 278 is pressed, HVAC controller 20 may display an illustrative screen 280, as shown in FIG. 24.

Screen 280 is similar to screen 252 (FIG. 23), but includes the changes made to the Wake period made in FIG. 23, and permits a user to select another time period to edit, if desired. However, screen 280 also includes a Done button 282. If the user wishes to edit another time period, they may, one at a time, press one or more of Wake button 254, Leave button 256, Return button 258 and/or Sleep button 260, and may edit the selected time period(s) as discussed with respect to FIG. 23. However, once the user has finished editing the time periods they wish to edit, they may inform HVAC controller 20 that they have finished by pressing Done button 282.

Once the user has pressed Done button 282, HVAC controller 20 may display an illustrative screen 284, which is shown in FIG. 25. In screen 284, HVAC controller 20 may display a message informing the user that HVAC controller 20 is saving the changes that the user has made. HVAC controller may then display an illustrative screen 286 as shown in FIG. 26.

In FIG. 26, screen 286 may include text asking the user if they wish to schedule other days. A Yes button 288 and a No button 290 permits the user to provide their answer. If the user presses No button 290, HVAC controller 20 may revert to screen 182 as seen in FIG. 18. If the user presses Yes button 288, HVAC controller 20 may revert to screen 226 as seen in FIG. 21. In some cases, the days already modified may be indicated by displaying “modified” within the individual day buttons, but this is not required.

Returning briefly to FIG. 18, another option for creating, editing and/or viewing a schedule is to press Guide Me Through Scheduling button 186. Pressing this button may cause HVAC controller 20 to display an illustrative screen 292, shown in FIG. 27. Screen 292 may be considered as an informational screen, as screen 292 provides a text message that informs the user that they will be asked a series of questions regarding their preferred comfort settings. A Back button 294 permits a user to return to a previous screen, if desired, while a Next button 296 permits a user to advance to the next screen.

In some instances, once the user has pressed Next button 296, HVAC controller 20 will provide an illustrative screen 298, as shown in FIG. 28. Screen 298 permits the user to select one or more days that will have the same schedule. Screen 298 may include a text message to this effect. In some cases, for example, a user may decide to have the same sched-

13

ule for Monday through Friday and a different schedule for Saturday and Sunday. Screen **298** includes a Monday button **300**, a Tuesday button **302**, a Wednesday button **304**, a Thursday button **306**, a Friday button **308**, a Saturday button **310** and a Sunday button **312**.

Screen **298** may include a Back button **314** that permits a user to return to a previous screen such as screen **292** (FIG. **27**), if desired, while a Cancel button **316** provides the user with an opportunity to revert to a previous screen or exit scheduling entirely. A Next button **318** permits the user to advance to a subsequent screen. In some cases, pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **320**, as seen in FIG. **29**.

Screen **320** may be the result of having selected Monday, Tuesday, Wednesday, Thursday and Friday via screen **298** (FIG. **28**), as screen **320** includes a text message **322** that reminds the user which day or days have been selected. As shown, text message **322** simply says "Monday-Friday". In some cases, it is considered that text message **322** may list each individual day by full name, by abbreviated name, and the like.

Screen **320** may include an interview question **324**, asking if someone is home during the day on the day or days being scheduled. The user may give an answer using either a Yes button **326** or a Not button **328**. If someone is home during the day, in some cases HVAC controller **20** may operate in accordance with a Wake time period and a Sleep time period, with the Leave and Return periods rolled into the Wake period or otherwise inactivated, for example. However, if no one is home during the day, HVAC controller **20** will in subsequent screens request scheduling and temperature information for all of the time periods.

For this example, assume the user pressed No button **328**. Screen **334** may include an interview question **336**, asking what time the first person wakes up. HVAC controller **20** may, in some cases, use this time as the starting point for the Wake time period. Screen **334** includes a time setting block **338** that displays the time period as well as a time at which the first person wakes up. Time setting block **338** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the time as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **344**, as seen in FIG. **31**. Screen **344** may include an interview question **346**, asking what time the last person leaves in the morning. HVAC controller **20** may, in some cases, use this time as the starting point for the Leave time period. Screen **344** includes a time setting block **348** that displays the time period as well as a time at which the last person leaves. Time setting block **348** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the time as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **350**, as seen in FIG. **32**. Screen **350** may include an interview question **352**, asking what time the first person returns home. HVAC controller **20** may, in some cases, use this time as the starting point for the Return time period. Screen **350** includes a time setting block **354** that displays the time period as well as a time at which the last person leaves. Time setting block **354** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the time as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **356**, as seen in FIG. **33**. Screen **356** may include an interview question **358**, asking what time the last person goes to sleep. HVAC controller **20** may, in some cases, use this time as the starting point for the Sleep time period. Screen **356** includes a time setting block **360** that

14

displays the time period as well as a time at which the last person goes to sleep. Time setting block **360** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the time as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **362**, as seen in FIG. **34**. Screen **362** may include an interview question **364**, asking what heating temperature is preferred when the user wakes up in the morning. HVAC controller **20** may, in some cases, use this temperature as the heating temperature set point for the Wake period. Screen **362** includes a temperature setting block **366** that displays the time period, a heating temperature set point and an indication of which temperature set point is being set. Temperature setting block **366** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **368**, as seen in FIG. **35**. Screen **368** may include an interview question **370**, asking what cooling temperature is preferred when the user wakes up in the morning. HVAC controller **20** may, in some cases, use this temperature as the cooling temperature set point for the Wake period. Screen **368** includes a temperature setting block **372** that displays the time period, a cooling temperature set point and an indication of which temperature set point is being set. Temperature setting block **372** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **374**, as seen in FIG. **36**. Screen **374** may include an interview question **376**, asking what heating temperature is preferred when the user is away from the house. HVAC controller **20** may, in some cases, use this temperature as the heating temperature set point for the Leave period. Screen **374** includes a temperature setting block **378** that displays the time period, a heating temperature set point and an indication of which temperature set point is being set. Temperature setting block **378** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired. In some cases, screen **374** may include a message **380** providing a suggested heating temperature set point.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **382**, as seen in FIG. **37**. Screen **382** may include an interview question **384**, asking what cooling temperature is preferred when the user is away from the house. HVAC controller **20** may, in some cases, use this temperature as the cooling temperature set point for the Leave period. Screen **382** includes a temperature setting block **386** that displays the time period, a cooling temperature set point and an indication of which temperature set point is being set. Temperature setting block **386** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired. In some cases, screen **382** may include a message **388** providing a suggested cooling temperature set point.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **390**, as seen in FIG. **38**. Screen **390** may include an interview question **392**, asking what heating temperature is preferred when the user returns home. HVAC controller **20** may, in some cases, use this temperature as the heating temperature set point for the Return period. Screen **390** includes a temperature setting block **394** that displays the time period, a heating temperature set point and an indication of which temperature set point is being set. Temperature setting block **394** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired.

15

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **396**, as seen in FIG. **39**. Screen **396** may include an interview question **398**, asking what cooling temperature is preferred when the user returns home. HVAC controller **20** may, in some cases, use this temperature as the cooling temperature set point for the Return period. Screen **396** includes a temperature setting block **400** that displays the time period, a cooling temperature set point and an indication of which temperature set point is being set. Temperature setting block **400** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **402**, as seen in FIG. **40**. Screen **402** may include an interview question **404**, asking what heating temperature is preferred when the user is sleeping. HVAC controller **20** may, in some cases, use this temperature as the heating temperature set point for the Sleep period. Screen **402** includes a temperature setting block **406** that displays the time period, a heating temperature set point and an indication of which temperature set point is being set. Temperature setting block **406** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **408**, as seen in FIG. **41**. Screen **408** may include an interview question **410**, asking what cooling temperature is preferred when the user is sleeping. HVAC controller **20** may, in some cases, use this temperature as the cooling temperature set point for the Sleep period. Screen **408** includes a temperature setting block **412** that displays the time period, a cooling temperature set point and an indication of which temperature set point is being set. Temperature setting block **412** includes an Up arrow **340** and a Down arrow **342** that may be used to adjust the temperature as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **414**, as seen in FIG. **42**. Screen **414** may include a question **416**, asking the user if they wish to schedule other days. A Yes button **418** and a No button **420** permit the user to provide an appropriate answer. If the user presses Yes button **418**, HVAC controller **20** may revert to screen **298** (FIG. **28**) so that the user may select additional days to schedule. In some cases, although this is not required, the day buttons representing the days that have already been scheduled may be labeled as “modified”.

Returning briefly to FIG. **42**, if the user presses No button **420**, HVAC controller **20** may display an illustrative screen **422**, as seen in FIG. **43**. Screen **422** may include a question **424**, inquiring as to whether or not the user wishes to review their schedule. A Yes button **426** and a No button **428** permit the user to provide an appropriate answer. If the user presses No button **428**, HVAC controller **20** may revert to screen **182** (FIG. **18**). If the user presses Yes button **426**, HVAC controller **20** may display an illustrative screen **430**, as shown in FIG. **44**.

Screen **430** may include a message **432** instructing the user that they may, if desired, further edit their schedule by pressing one of the time periods. Screen **430** may include a Wake button **434**, a Leave button **436**, a Return button **438** and a Sleep button **440**. Screen **430** may include a View Individual Days button **442** that may, if pressed, instruct HVAC controller **20** to display only a single day at a time. Screen **430** may then include a Next Day button (not illustrated). A Next Group of Days button **444** may, if pressed, instruct HVAC controller **20** to display another group of days. For example,

16

HVAC controller **20** may display Saturday and Sunday. A Done button **446** may, if pressed, inform HVAC controller **20** that the user is finished.

Each of Wake button **434**, Leave button **436**, Return button **438** and Sleep button **440** may include or otherwise display one or more of period starting time, period heating temperature set point and/or period cooling temperature set point. If the user wishes to edit one of the time periods, they may do so by pressing the desired time period button. For example, pressing Wake button **434** may cause HVAC controller **20** to display an illustrative screen **448**, as shown in FIG. **45**.

Screen **448** may include one or more of a time block **450**, a cooling temperature block **452** and/or a heating temperature block **454**. Time block **450** may display a starting time for the Wake period, and may include Up arrow **340** and Down arrow **342** so that the user may adjust the starting time, if desired. Cooling temperature block **452** may display a cooling temperature for the Wake period, and may include Up arrow **340** and Down arrow **342** so that the user may adjust the cooling temperature, if desired. Heating temperature block **454** may display a heating temperature for the Wake period, and may include Up arrow **340** and Down arrow **342** so that the user may adjust the heating temperature, if desired. It will be appreciated that HVAC controller **20** may display a similar screen in response to the user pressing (with respect to FIG. **44**), any of Wake button **434**, Leave button **436**, Return button **438** and Sleep button **440**.

In some instances, screen **448** may include text **456** informing the user that they have the opportunity to set the wake time and temperatures (or whichever time period is being displayed as a result of having pressed a particular time period button with respect to screen **430**, shown in FIG. **44**). The user may have the opportunity to simply delete the displayed time period by pressing a Delete Period button **458**. A Help button **460** may be pressed to obtain additional information, selection options, and the like.

FIG. **46** provides an illustrative screen **462** that may be provided by HVAC controller **20** if, with respect to previous Figures, the user presses Cancel button **316** during some of the scheduling screens. Screen **462** includes text **464** that informs the user that their changes will not be saved if they cancel. An inquiry **466** asks the user to confirm if they wish to cancel, knowing that their changes will not be saved. A Yes button **468** and a No button **470** permit a user to enter their preference.

FIGS. **47** through **53** provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller **20** pertaining to creating, editing and/or viewing a vacation schedule within HVAC controller **20**. In particular, FIG. **47** provides an illustrative screen **472** that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Vacation Mode button **154** (FIG. **17**).

Screen **472** may include text **474** that instructs the user to enter the date that they will be leaving on vacation. A Month block **476** displays a month, and Up arrow **340** and/or Down arrow **342** may be used to scroll up and/or down to the desired month. A Date block **478** displays a day of the month that can be adjusted up or down using Up arrow **340** and/or Down arrow **342** as desired. As illustrated, the date is displayed using numbers 1 through 31. In some cases, the corresponding day of the week (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday) may also be displayed, but this is not required. Cancel button **316** may, if pressed, cause HVAC controller **20** to revert to screen **150** (FIG. **17**).

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **480**, as shown in FIG. **48**. Screen **40** may include text **482** that instructs the user to set the time

17

that they will be leaving on vacation. In some cases, as illustrated, text **482** may reference the date previously set with respect to screen **472** (FIG. **47**) but this is not required. A time block **484** displays a departure time that can be adjusted using Up arrow **340** and/or Down arrow **342**, as appropriate. Back button **314** permits the user to return to the previous screen, if, for example the date was set incorrectly.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **486**, shown in FIG. **49**. In some cases, screen **486** may include text **488** instructing the user to enter a temperature that they want to maintain while they are on vacation. In some instances, as illustrated, screen **486** may include a cooling temperature block **490** displaying a cooling temperature set point and a heating temperature block **492** displaying a heating temperature set point. Cooling temperature block **490** and/or heating temperature block **492** may each independently include UP arrow **340** and Down arrow **342** for adjusting temperature settings as desired. In some cases, screen **486** may instead include only a single temperature block (not illustrated), particularly if the user does not take advantages of the programmability of HVAC controller **20** and instead simply uses HVAC controller **20** to hold a particular constant temperature, or if only a heating system or only a cooling system is included as part of the HVAC system. Back button **314** permits the user to return to the previous screen, if desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **494**, as shown in FIG. **50**. Screen **494** may include text **496** that instructs the user to enter the date that they will be returning from vacation. A Month block **498** displays a month, and Up arrow **340** and/or Down arrow **342** may be used to scroll up and/or down to the desired month. A Date block **500** displays a day of the month that can be adjusted up or down using Up arrow **340** and/or Down arrow **342** as desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **502**, as shown in FIG. **51**. Screen **502** may include text **504** that instructs the user to set the time that they will be returning from vacation. In some cases, as illustrated, text **504** may reference the date previously set with respect to screen **486** (FIG. **49**) but this is not required. A time block **506** displays a return time that can be adjusted using Up arrow **340** and/or Down arrow **342**, as appropriate. Back button **314** permits the user to return to the previous screen, if, for example the date was set incorrectly.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **508**, shown in FIG. **52**. In some cases, screen **508** may include text **510** instructing the user to enter a temperature that they want when they return from vacation. In some instances, as illustrated, screen **508** may include a cooling temperature block **512** displaying a cooling temperature set point and a heating temperature block **513** displaying a heating temperature set point. Cooling temperature block **512** and/or heating temperature block **513** may each independently include UP arrow **340** and Down arrow **342** for adjusting temperature settings as desired. In some cases, screen **508** may instead include only a single temperature block (not illustrated), particularly if the user does not take advantages of the programmability of HVAC controller **20** and instead simply uses HVAC controller **20** to hold a particular constant temperature, or if only a heating system or only a cooling system are included as part of the HVAC system. Back button **314** permits the user to return to the previous screen, if desired.

Pressing Next button **318** may cause HVAC controller **20** to display an illustrative screen **514**, as shown in FIG. **53**. Screen **514** may include text **516** that asks the user to confirm their

18

vacation settings. If there is an error, or the user wishes to make any changes, they may do so by pressing Back button **314** and HVAC controller **20** will provide the appropriate screens to make any necessary changes. If the user agrees with the vacation settings, they may inform HVAC controller **20** thereof by pressing Yes button **520**.

FIGS. **54** through **60** provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller **20** pertaining to changing and/or viewing humidification and dehumidification settings within HVAC controller **20**. In particular, FIGS. **54-57** provide illustrative screens that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Humidification button **156** (FIG. **17**), FIGS. **58-59** provide illustrative screen that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Dehumidification button **158** (FIG. **17**) and FIG. **60** provides an illustrative screen that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Southern Dehumidification Mode button **172** (FIG. **17**).

FIG. **54** provides an illustrative screen **522** that may include text **524** instructing the user to select or set their humidification setting. HVAC controller **20** may, for example, use the humidification setting in controlling a humidifier such as a whole-house humidifier. HVAC controller **20** may, for example, display a parameter adjustment element for use in adjusting an operating parameter such as humidification, the parameter adjustment element may include an indicator that provides a qualitative indication for at least the current setting of the operating parameter.

To illustrate, screen **522** includes a slider bar **526** that has a scale **528**, a display **530**, a Left arrow **532** and a Right arrow **534**. Scale **528** can be seen as including text describing the humidification setting in relative or qualitative terms such as “Dry”, “Comfort Zone” and “Wet”. These particular terms are merely representative, as other terms may also be used. More generally, scale **528** may provide a qualitative context to a particular humidity value (e.g. 42%) so that a user unfamiliar with humidity values can still choose an appropriate humidity setting.

Display **530** may, as illustrated, provide a reminder that it is the indoor humidity setting that is being displayed as well as a current indoor humidity setting or current indoor humidity reading. FIG. **55** provides an illustrative screen **536** having a display **538** that provides a display of the current indoor humidity setting or reading as well as an indication that frost protection has been activated, as will be discussed with respect to subsequent Figures.

Returning to FIG. **54**, slider bar **526** may be seen as including an indicator button **540** that may be moved left and/or right using left arrow **532** and/or right arrow **534**, as desired. Indicator button **540** may, with respect to scale **528**, provide a visual indication of the relative or qualitative humidity setting and may, if desired, include a pointer that interacts with scale **528**. Scale **528** may provide upper and/or lower numerical limits for the displayed parameter. In some instances, indicator button **540** may include a numerical representation of the indoor humidity setting.

In some cases, indicator button **540** may move a prescribed distance either left or right in response to the user pressing either left arrow **532** or right arrow **534**. In some cases, the distance that indicator button **540** moves may be at least partially a function of how many times left arrow **532** and/or right arrow **534** are pressed. In some instances, the distance that indicator button **540** moves may be at least partially a function of how long left arrow **532** and/or right arrow **534** are held down by the user. In some cases, indicator button **540**

may be a touch-sensitive button, and may be moved left or right simply by the user touching indicator button **540** and dragging their finger left or right.

Screen **522** may include a Disable Humidification button **542**. In some cases, a user may not wish to provide HVAC controller **20** with humidification settings. For example, in warm climates, the user may not want or need to operate a humidifier such as a whole-house humidifier that is controlled by HVAC controller **20**. In some cases, a user's HVAC equipment may not include any humidification equipment. In situations such as these, the user may deactivate this functionality by pressing Disable Humidification button **542**. FIG. **56** provides an illustrative screen **552** that is similar to screen **522** (FIG. **54**), but shows that HVAC controller **20** has grayed out slider bar **526** as a result of the user having pressed Disable Humidification button **542**. It can be seen that text **524** also states that humidification has been disabled. In some cases, screen **552** may include an Enable Humidification button **554**.

Returning to FIG. **54**, screen **522** may include a Window Frost Protection Setting button **544**, as will be discussed with respect to FIGS. **57** and **58**. A Help button **546** may, if pressed, provide further information explaining humidification, providing clarification regarding options, and the like. A Cancel button **548**, if pressed, may cause HVAC controller **20** to revert to screen **150** (FIG. **17**) without saving any changes that may have been made. A Done button **550**, if pressed, informs HVAC controller **20** that the humidification setting has been completed, and as a result, may revert to screen **150** (FIG. **17**).

Pressing Window Frost Protection Setting button **544** (FIG. **54**) may cause HVAC controller **20** to display an illustrative screen **556**, as shown in FIG. **57**. In some ways, selecting an indoor humidification setting is similar to selecting a window frost protection setting, as the risk of window condensation, particularly in cold weather, is at least partially a function of the indoor air humidity. However, window condensation is also at least partially a function of the efficiency of the windows within the house or other building.

An old, inefficient window such as a single-pane window may present a relatively cold glass surface to the heated atmosphere within the building. Condensation is more likely in this situation. In contrast, a newer, more efficient window such as a double-pane window or even a triple-pane window will present a relatively warmer glass surface to the heated atmosphere within the building. Thus, an efficient window may tolerate a relatively higher indoor humidity without excessive window condensation. It will be recognized, of course, that outdoor temperature may also play a part. In some cases, HVAC controller **20** may be in communication with an exterior temperature sensor and may be programmed to adjust humidity settings and/or window frost protection settings accordingly.

Screen **556** may include text **558** that informs the user that they are to select a setting for window frost protection. Screen **556** includes a slider bar **560** that has a scale **562**, a display **564**, a left arrow **532** and a right arrow **534**. Scale **562** may include text describing the window frost protection setting in relative or qualitative terms such as "Less Efficient" and "More Efficient". It will be recognized that this refers to the relative efficiency of the windows within the building. Display **564** may, as illustrated, provide a reminder that it is the window energy efficiency setting that is being displayed.

Slider bar **560** may be seen as including an indicator button **563** that may be moved left and/or right using left arrow **532** and/or right arrow **534**, as desired. Indicator button **563** may, with respect to scale **562**, provide a visual indication of the relative or qualitative humidity setting and may, if desired, include a pointer that interacts with scale **562**. In some

instances, indicator button **563** may include a numerical representation of the window frost protection setting.

Indicator button **563** may be moved using either left arrow **532** or right arrow **534**. In some cases, the distance that indicator button **563** moves may be at least partially a function of how many times or for how long left arrow **532** and/or right arrow **534** are pressed. In some cases, indicator button **563** may be a touch-sensitive button, and may be moved left or right simply by the user touching indicator button **563** and dragging their finger left or right. A Humidification Setting button **565** may be pressed if the user wishes to return to screen **522** (FIG. **54**) to alter the humidification setting. Cancel button **548**, if pressed, may cause HVAC controller **20** to revert to screen **150** (FIG. **17**) without saving any changes that may have been made. Done button **550**, if pressed, informs HVAC controller **20** that the window frost protection setting has been completed, and as a result, may revert to screen **150** (FIG. **17**).

FIG. **58** shows an illustrative screen **566** that may include text **568** instructing the user to select or set their dehumidification setting. HVAC controller **20** may, for example, use the dehumidification setting to control operation of a dehumidifier or an air exchanger. Screen **566** includes a slider bar **570** that has a scale **572**, a display **574**, a Left arrow **532** and a Right arrow **534**. Scale **572** can be seen as including text describing the dehumidification setting in relative or qualitative terms such as "Dry", "Comfort Zone" and "Wet". These particular terms are merely representative, as other terms may also be used. More generally, scale **572** may provide a qualitative context to a particular humidity value (e.g. 42%) so that a user unfamiliar with humidity values can still choose an appropriate dehumidification setting.

Display **574** may, as illustrated, provide the current indoor humidity setting or current indoor humidity reading. Slider bar **570** may be seen as including an indicator button **576** that may be moved left and/or right using left arrow **532** and/or right arrow **534**, as desired. Indicator button **576** may, with respect to scale **572**, provide a visual indication of the dehumidification setting and may, if desired, include a pointer that interacts with scale **574**. In some instances, indicator button **576** may include a numerical representation of the indoor humidity setting.

Indicator button **576** may be moved using either left arrow **532** or right arrow **534**. In some cases, the distance that indicator button **576** moves may be at least partially a function of how many times or for how long left arrow **532** and/or right arrow **534** are pressed. In some cases, indicator button **576** may be a touch-sensitive button, and may be moved left or right simply by the user touching indicator button **562** and dragging their finger left or right.

Screen **566** may, as illustrated, include a Disable Dehumidification button **578**. Pressing Disable Dehumidification button **578** may cause HVAC controller **20** to display an illustrative screen **580** as shown in FIG. **59**. It can be seen that in screen **580**, slider bar **570** has been grayed out. Text **568** may also include a message reminding the user that dehumidification has been disabled. The user may wish to disable dehumidification if, for example, their HVAC equipment does not include a dehumidifier or an air exchanger. In some cases, screen **580** may include an Enable Dehumidification button **582**.

Returning to FIG. **58**, cancel button **548**, if pressed, may cause HVAC controller **20** to revert to screen **150** (FIG. **17**) without saving any changes that may have been made. Done button **550**, if pressed, informs HVAC controller **20** that the dehumidification setting has been completed, and as a result, may revert to screen **150** (FIG. **17**).

21

FIG. 60 shows an illustrative screen 584 that may, for example, be reached by pressing Southern Dehumidification Mode button 172 (FIG. 17). Screen 584 provides the user with settings information pertaining to a southern dehumidification mode. Help button 546 may provide educational or information messages pertaining to the southern dehumidification mode, and/or may discuss possible options. Cancel button 548, if pressed, may cause HVAC controller 20 to revert to screen 150 (FIG. 17).

FIGS. 61 through 66 provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller 20 pertaining to changing and/or viewing ventilation settings within HVAC controller 20. HVAC controller 20 may use these settings, for example, to control operation of an air exchanger or the like. In particular, FIG. 61 provides an illustrative screen 586 that may be displayed by HVAC controller 20 in response to someone pressing or otherwise selecting Ventilation button 160 (FIG. 16).

Screen 586 may include a menu bar 588 that includes navigational information so that the user may better remember and/or understand where they are within the menu and how they got there. Screen 586 may include one or more of an Automatic button 590, an On button 592 and an Off button 594. If the user presses Automatic button 590, HVAC controller 20 may operate the air exchanger only when, for example, other HVAC equipment such as a forced air furnace or an air conditioner is operating, or perhaps operate the air exchanger in accordance with dehumidification settings. Pressing On button 592 may cause HVAC controller 20 to operate the air exchanger at all times while pressing corresponding Off button 594 may cause HVAC controller 20 to not operate the air exchanger at all.

In some cases, screen 586 may include a Temporary Override button 596. In some cases, a user may want the air exchanger to run constantly for a relatively short period of time. Examples of when this may occur, for example, include a desire to eliminate strong cooking odors or perhaps steam from a hot shower. If the user presses Temporary Override button 596, HVAC controller 20 may display an illustrative screen 598, as shown in FIG. 62.

Screen 598 includes a time block 600 that may be used to enter or edit a length of time for which the air exchanger will operate. Time block 600 may include a numerical display 602 representing a length of time in any appropriate units such as minutes. Up arrow 604 and down arrow 606 may be used, as desired, to increase or decrease the length of time for operating the air exchanger. A Cancel button 608 may, if pressed, cause HVAC controller 20 to revert to a previous screen such as screen 150 (FIG. 17). A Done button 610, if pressed, tells HVAC controller 20 that a desired length of time has been entered, and thus HVAC controller 20 operates the air exchanger continuously for the specified length of time. In some cases, pressing Done button 610 also causes HVAC controller 20 to revert to screen 150 (FIG. 17).

Returning to FIG. 61, it is noted that screen 586 includes Cancel button 608 and Done button 610, as discussed with respect to FIG. 62. In FIG. 61, Temporary Override button 596 was pressed to bring up screen 598 (FIG. 62), with screen 598 including time block 600. In some cases, as seen in illustrative screen 612 (FIG. 63), time block 600 may instead be displayed on the same screen as Automatic button 590, On button 592 and Off button 594, for example.

In some cases, a user may wish to set ventilation settings based at least partially on time, or perhaps on particular time periods such as one or more of the Wake, Leave, Return and/or Sleep periods. FIG. 64 provides an illustrative screen 614 that includes a Vent in All Periods button 616 and a Do

22

Not Vent While Sleeping button 618. If the user presses Vent in All Periods button 616, they may be provided an opportunity to set ventilation settings for one or more of the aforementioned time periods. If they press Do Not Vent While Sleeping button 618, they may be given the opportunity to set ventilation settings for one or more the aforementioned time periods absent the Sleep period. In some cases, other options such as a Do Not Vent while Gone button. A Help button 620 may, if pressed, provide the user with more information pertaining to their options.

In the illustrative embodiment, pressing one of Vent in All Periods button 616 or Do Not Vent While Sleeping button 618 may cause HVAC controller 20 to display an illustrative screen 622, as shown in FIG. 65. Screen 622 may include text 624 instructing the user to set ventilator settings for each time period shown. Screen 622 may include one or more of a Wake button 626, a Leave button 628, a Return button 630 and a Sleep button 632, each of which may display a current ventilator setting. A Back button 634 permits the user, if desired, to return to a previous screen.

The user may alter the ventilator setting for a particular time period by pressing the corresponding time period button. For example, if the user presses Wake button 626, HVAC controller 20 may display an illustrative screen 636, as shown in FIG. 66. Text 624 may include a message instructing the user to set the ventilation setting for the Wake period. Screen 636 may include an Automatic button 638 and an Off button 640. In some cases, screen 636 may also include an On button (not illustrated). By pressing one of Automatic button 638 and Off button 640, the user may select their desired ventilation setting for the Wake period. The other time periods may be set in a similar manner.

FIGS. 67 through 69 provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller 20 pertaining to viewing system information within HVAC controller 20. In particular, FIG. 67 provides an illustrative screen 642 that may be displayed by HVAC controller 20 in response to someone pressing or otherwise selecting System Information button 162 (FIG. 17) in order to obtain system information such as equipment status, dealer information and the like.

Screen 642 may include a navigational bar 644 that assists the user in navigating through the menus provided by HVAC controller 20. Screen 642 may include one or more of a View Equipment Status button 646 that may be used by the user to view a summary of their equipment status and a View Dealer Information button 648 that may be used by the user to obtain dealer information. The user may want to obtain dealer information, for example, if there is a problem with the HVAC equipment, or perhaps if routine maintenance, filter replacement, and the like is needed. A Previous Menu button 650 may permit the user to return to a previous screen.

Pressing View Equipment Status button 646 may cause HVAC controller 20 to display an illustrative screen 652, as shown in FIG. 68. Navigational bar 644 may, as illustrated, reflect the current relative position within the menu structure. Screen 652 provides information pertaining to one or more of heating status, cooling status, fan mode, humidifier status, dehumidifier status, air filter replacement status, UV lamp replacement status, equipment timers, wireless devices, and such. In some cases, there may be more information to display than fits within screen 652. In some instances, screen 652 may include an Up arrow 654 and a Down arrow 656 so that the user may scroll through the displayed information. A Done button 658 informs HVAC controller 20 that the user is finished, and may cause HVAC controller 20 to revert to a previous screen such as screen 642 (FIG. 67).

Pressing View Dealer Information button **648** may cause HVAC controller **20** to display an illustrative screen **660**, as shown in FIG. **69**. Navigational bar **644** may, as illustrated, reflect the current relative position within the menu structure. Screen **660** provides contact information such as name, address, telephone number and/or email address for an HVAC contractor that installed and/or services the system, for example. As noted above, the user may wish to contact the dealer if there is a problem or if, for example, they want to order replacement parts such as air filters, humidifier pads, UV lamps and the like.

In some cases, a "Service Request" button may be provided that sends a message to the identified contractor and requests the contractor to address the issue. HVAC controller **20** may contact the contractor by email message, text message, or the like. The message may, for example, include appropriate part numbers or other diagnostic information so that the contractor can bring the appropriate parts and/or equipment. Of course, HVAC controller **20** would have to be provided with telephone or other Internet access in order to provide this functionality.

FIGS. **70** through **72** provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller **20** pertaining to viewing and/or changing date and time information within HVAC controller **20**. In particular, FIG. **70** provides an illustrative screen **662** that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Date/Time button **164** (FIG. **17**) in order to view and/or change date and time information.

Screen **662** may include a navigational bar **664** that informs the user of their current relative position within the menu structure. Screen **662** may include one or more of a Set Time button **666**, a Set Date button **668** and a Previous Menu button **670**. The user may press Set Time button **666** in order to view or change time settings, or may press Set Date button **668** to view or change date settings. Previous Menu button **670** may cause HVAC controller **20** to revert to a previous screen.

Pressing Set Time button **666** may cause HVAC controller **20** to display an illustrative screen **672**, as shown in FIG. **71**. Screen **672** may include one or more of a hour block **674**, a minute block **676** and an AM/PM block **678**. Hour block **674** may display a current hour time setting and may include an Up arrow **680** and a Down arrow **682** that may be used to increase or decrease the current hour time setting, as desired. Minute block **676** may display a current minute time setting that can be increased or decreased using Up arrow **680** and/or Down arrow **682**, as appropriate. AM/PM block **678** may display an indication of whether the current time is AM or PM. Up arrow **680** and/or Down arrow **682** may be used to adjust whether the current time is before noon or after noon. A Cancel button **684**, if pressed, may cause HVAC controller **20** to revert to a previous screen without saving any changes. A Done button **686** may cause HVAC controller **20** to save any time changes made, and to subsequently revert to screen **662** (FIG. **70**).

Pressing Set Date button **668** may cause HVAC controller **20** to display an illustrative screen **688**, as shown in FIG. **72**. Screen **688** may include one or more of a Month block **690**, a Day block **692** and a Year block **694**. Month block **690** may display a current month setting that can be adjusted, if desired, using Up arrow **680** and/or Down arrow **682**. Day block **692** may display a current day setting that can be adjusted up or down via Up arrow **680** and/or Down arrow **682**. Year block **694** may display a current year setting that can be adjusted, if necessary, using Up arrow **680** and Down arrow **682**. Cancel button **684**, if pressed, may cause HVAC controller **20** to revert to a previous screen without saving any

changes. Done button **686** may cause HVAC controller **20** to save any time changes made, and to subsequently revert to screen **662** (FIG. **70**).

FIGS. **73** through **95** provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller **20** pertaining to viewing and/or changing preferences within HVAC controller **20**. In particular, FIG. **73** provides an illustrative screen **700** that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Preferences button **166** (FIG. **17**) in order to view and/or change preferences information.

Screen **700** includes a navigational bar **702** that may provide the user with information pertaining to where they are within the menu structure. A Previous Menu button **704** permits the user to, if desired, return to a previous menu. In some cases, pressing Previous Menu button **704** may cause HVAC controller **20** to revert to screen **150** (FIG. **17**). Screen **700** may include a number of menu items for which preferences may be selected. In some cases, there may be more menu items than can be displayed at one time on screen **700**. Thus, in some cases screen **700** may include an Up arrow button **730** and a Down arrow button **732** so that the user may scroll up and/or down through the menu items. In FIG. **73**, various menu items are shown including some that are shown outside of screen **700**. It should be understood that this is only illustrative, and that Up arrow button **730** and/or Down arrow button **732** may be used to scroll through these various menu items on screen **700**.

In some instances, screen **700** may display one or more of a Reminders button **706**, a Fahrenheit/Celsius button **708**, a 12 h/24 h Clock button **710**, a Display Options button **712**, a Language Options button **714**, a Schedule Options button **716**, an Adaptive Intelligent Recovery button **718**, a Restore Energy Star Settings button **720**, an Unoccupied Settings button **722**, a Ventilation Settings button **724**, a Wireless Device Manager button **726** and a Daylight Savings Time button **728**.

Pressing Reminders button **706** may cause HVAC controller **20** to display an illustrative screen **734**, as shown in FIG. **74**. Navigational bar **702** may, for example, display information informing the user that they have selected Reminders under Preferences, which is itself a menu item. Screen **734** may include, for example, one or more of a Humidifier Pad button **736**, an Air Filter button **738**, a UV lamp button **740**, and a Ventilator Filter button **742**. A Help button **744**, if pressed, may provide the user with information describing and/or explaining the options.

FIG. **75** provides an illustrative screen **746** that may be reached by pressing one of Humidifier Pad button **736**, Air Filter button **738**, UV lamp button **740**, or Ventilator Filter button **742**. As shown, screen **746** provides a generic illustration, but it will be recognized that HVAC controller **20** may correctly and properly reference a specific piece of equipment, depending on which menu button was pressed with respect to screen **734** (FIG. **74**). For example, if the user pressed Humidifier Pad button **736** one week before the expiration of the time period ascribed to the humidifier pad, screen **746** may state "Your system's humidifier pad has seven days remaining in its current cycle. It is set to be changed every year. When you have replaced your humidifier pad, please press Reset." Similar messages may be displayed pertaining to the air filter, ventilator filter, UV lamp and the like.

Once the user replaces the appropriate piece of equipment, they may reset the timer for that piece of equipment by pressing a Reset Timer button **748**. Help button **744** may provide the user with additional information while a Done button **752** may cause HVAC controller **20** to revert to a previous screen

25

such as screen 734 (FIG. 74). In some cases, the user may wish to alter the predetermined time period for a particular piece of equipment. For example, the user may determine that the humidifier pad becomes too dirty and mineral-encrusted when used for an entire year. A Change Life Cycle button 750, if pressed, may permit the user to alter the time period.

FIG. 76 provides an illustrative screen 754 that may be displayed by HVAC controller 20 when Change Life Cycle button 750 (FIG. 75) is pressed. Again, screen 754 illustrates a generic message that may be customized in accordance with which of Humidifier Pad button 736, Air Filter button 738, UV lamp button 740, or Ventilator Filter button 742 was pressed with respect to screen 734 (FIG. 74). In this particular case, it can be seen via navigational bar 702 that the user is being given a chance to alter the life cycle of the humidifier pad.

Screen 754 may include a timer block 756 that displays a current life cycle as well as whether the life cycle is being displayed in days, weeks, or the like. An Up button 758 may be used to increase the life cycle and a Down button 760 may be used to decrease the life cycle. A Cancel button 762 permits the user to exit screen 754 without making any changes, if desired, while Done button 752 may cause HVAC controller 20 to revert to a previous screen such as screen 734 (FIG. 74).

Returning briefly to FIG. 73, pressing Fahrenheit/Celsius button 708 may cause HVAC controller 20 to display an illustrative screen 764, as shown in FIG. 77. Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. Screen 764 includes a Fahrenheit button 766 and a Celsius button 768. If the user wants HVAC controller 20 to display temperatures and temperature set points in degrees Fahrenheit, they may instruct HVAC controller 20 to do so by pressing Fahrenheit button 766. Similarly, if the user wants HVAC controller 20 to display in degrees Celsius, they may instruct HVAC controller 20 to do so by pressing Celsius button 768. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

FIG. 78 provides an illustrative screen 770 that may be displayed by HVAC controller 20 as a result of the user pressing 12 h/24 h Clock button 710 (FIG. 73). Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. Screen 770 includes a 12 Hour Clock button 772 and a 24 Hour Clock button 774. If the user wants HVAC controller 20 to display time using numbers 0 through 12, and AM/PM, they may instruct HVAC controller 20 to do so by pressing 12 Hour Clock button 772. If the user wants HVAC controller 20 to display time using numbers 0 through 24, without using AM or PM, they may instruct HVAC controller 20 to do so by pressing 24 Hour Clock button 774. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

Returning briefly to FIG. 73, if the user presses Display Options button 712, HVAC controller 20 may display an illustrative screen 776, as shown in FIG. 79. Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. Previous Menu button 704 permits the user to revert to a previous screen. Screen 776 may include, for example, one or more a Backlight button 778, a Contrast button 780 and a Screensaver button 782. These are display options that can be customized or otherwise modified by the user.

26

Pressing Backlight button 778 may cause HVAC controller 20 to display an illustrative screen 786, as shown in FIG. 80. Screen 786 may include text 788 that instructs the user to set their inactive backlight level. A slider bar 788 includes a scale 790, a display 792, a Left arrow 794 and a Right arrow 796. Scale 790 may provide relative or qualitative terms such as dim and bright. Display 792 may, as illustrated, provide a reminder that it is the backlight level that is being set. Slider bar 788 includes an indicator 798 that may be moved left and/or right using left arrow 794 and/or right arrow 796, as desired. Indicator button 798 may, with respect to scale 790, provide a visual indication of the relative or qualitative backlight level and may, if desired, include a pointer that interacts with scale 790. In some instances, indicator button 798 may include a numerical representation of the backlight level setting. In some cases, the numerical representation may range from 0 to 10, or perhaps 1 to 10.

In some cases, the distance that indicator button 798 moves may be at least partially a function of how many times or for how long left arrow 794 and/or right arrow 796 are pressed. In some cases, indicator button 798 may be a touch-sensitive button, and may be moved left or right simply by the user touching indicator button 798 and dragging their finger left or right. Help button 744 may provide the user with further information. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

Returning briefly to FIG. 79, pressing Contrast button 780 may cause HVAC controller 20 to display an illustrative screen 800, as shown in FIG. 81. Screen 800 may include text 802 that instructs the user to set their contrast level. A slider bar 803 includes a scale 804, a display 806, a Left arrow 808 and a Right arrow 810. Scale 804 may provide relative or qualitative terms such as less contrast and more contrast. Display 806 may, as illustrated, provide a reminder that it is the contrast level that is being set. Slider bar 803 includes an indicator 812 that may be moved left and/or right using left arrow 808 and/or right arrow 810, as desired. Indicator button 812 may, with respect to scale 804, provide a visual indication of the relative or qualitative backlight level and may, if desired, include a pointer that interacts with scale 804. In some instances, indicator button 812 may include a numerical representation of the contrast level setting.

In some cases, the distance that indicator button 812 moves may be at least partially a function of how many times or for how long left arrow 808 and/or right arrow 810 are pressed. In some cases, indicator button 812 may be a touch-sensitive button, and may be moved left or right simply by the user touching indicator button 812 and dragging their finger left or right. Help button 744 may provide the user with further information. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

Returning briefly to FIG. 79, pressing Screensaver button 782 may cause HVAC controller 20 to display an illustrative screen 814, as shown in FIG. 82. Screen 814 may include text 816 that instructs the user to set the screensaver timeout time. A timer block 818 may display the current timeout time that may be increased using an Up button 820 and/or may be decreased using a Down button 822. Help button 744 may provide the user with further information. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

27

In some cases, a Screensaver Select button may be provided, which may allow a user to select a particular screen-saver from a list of screen savers for use by HVAC controller 20. In some cases, at least some screen savers may be uploaded into HVAC controller 20 by the user for later selection. In some instances, screen savers may be uploaded using data port 18 (FIG. 1).

Returning briefly to FIG. 73, pressing Language Options button 714 may cause HVAC controller 20 to display an illustrative screen 824, as shown in FIG. 83. Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. In some instances, HVAC controller 20 may be configured to display text in one or more of several languages. Screen 824 may include one or more of an English button 826, a French button 828 and a Spanish button 830. These buttons are shown for illustrative purposes only as it will be recognized that other languages may be represented either in place of these or in addition to these.

If the user wants HVAC controller 20 to display text using English, they may instruct HVAC controller 20 to do so by pressing English button 826. If the user wants HVAC controller 20 to display text using French, they may instruct HVAC controller 20 to do so by pressing French button 828. HVAC controller 20 may be instructed to display text in Spanish if the user presses Spanish button 830. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

Returning briefly to FIG. 73, pressing Schedule Options button 716 may cause HVAC controller 20 to display an illustrative screen 832, as shown in FIG. 84. Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. In some cases, HVAC controller 20 may be a programmable HVAC controller that may operate in accordance with a predetermined or user-entered or modified schedule. In some instances, HVAC controller 20 may not be a programmable HVAC controller. Screen 832 includes a Programmable button 834 and a Non-Programmable button 836. The user may specify whether HVAC controller 20 is programmable or non-programmable by pressing the appropriate button. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

With respect to FIG. 73, pressing Adaptive Intelligent Recovery button 718 may cause HVAC controller 20 to display an illustrative screen 838, as shown in FIG. 85. Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. Screen 838 may include an On button 840 and an Off button 842. Adaptive Intelligent Recovery may be turned on by pressing On button 840 and/or may be turned off by pressing Off button 842. Adaptive Recovery may implement a control algorithm that initiates the HVAC equipment at an appropriate time before a step change in temperature set points (e.g. at a transition between programmable time periods) such that the temperature in the building reaches the new set point at or about the time that the temperature change is set to take place. Help button 744 may provide the user with further information. The user may cancel out, if desired, using Cancel button 762. Pressing Done button 752 may cause HVAC controller 20 to save any changes made and/or revert to a previous screen.

Returning briefly to FIG. 73, pressing Restore Energy Star Settings button 720 may cause HVAC controller 20 to display an illustrative screen 844, as shown in FIG. 86. Navigational

28

bar 702 provides the user with an indication of where they are within the hierarchical menu structure. Screen 844 may, as illustrated, include text giving the user an explanation of what an Energy Star schedule is and what it involves. Screen 844 may include a Select Energy Star Schedule button 846 that, if pressed, may cause HVAC controller 20 to operate in accordance with a predetermined and/or pre-programmed schedule that is designed for energy savings. The Energy Star program may be entered into HVAC controller 20 at the time of its manufacture, for example.

Returning briefly to FIG. 73, pressing Unoccupied Settings button 722 may cause HVAC controller 20 to display an illustrative screen 848, shown in FIG. 87. In some cases, HVAC controller 20 may be programmed or otherwise configured to permit operation of the HVAC equipment in accordance with an unoccupied setting, i.e., anytime the house is temporarily unoccupied. In some cases, this may correspond to the Leave period, or when HVAC controller 20 has been instructed that the house will be temporarily vacant as a result of vacation and the like. In some instances, it is contemplated that HVAC controller 20 may instead include or be in communication with one or more sensors that register whether someone is in the house, and thus may operate in accordance with an unoccupied setting when the house is sensed to be empty.

Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. Screen 848 may include text 850 that informs the user that they are viewing and/or changing the unoccupied heating and cooling temperature set points. Screen 848 may include a heating block 852 and a cooling block 854. Heating block 852 may include a display of the present unoccupied heating temperature set point and may include up arrow 758 and down arrow 760 that can be used to raise or lower the heating temperature set point, as desired. Cooling block 854 may include a display of the present unoccupied cooling temperature set point, which can be raised or lowered using up arrow 758 and/or down arrow 760, as desired.

Returning briefly to FIG. 73, pressing Ventilation Settings button 724 may cause HVAC controller to display screen 614, which is shown in FIG. 64 as previously discussed with respect to Ventilation button 160 (FIG. 17). Pressing Wireless Device Manager button 726 (FIG. 73) may cause HVAC controller 20 to display an illustrative screen 856, as shown in FIG. 88. Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. Previous Menu button 704 provides the user with an opportunity to reach a previous screen while Help button 744 may provide the user with additional information and/or guidance. Screen 856 may include, for example, one or more of an Add Device button 858, a View Connected Devices button 860, a Remove Device button 862 and/or a Rename Thermostat button 864. Wireless devices that may communicate with HVAC controller 20 include, for example, exterior temperature sensors, exterior humidity sensors, exterior wind sensors, interior humidity sensors, HVAC equipment, computers, computer networks, and the like.

Pressing Add Device button 858 may cause HVAC controller 20 to display an illustrative screen 866, as shown in FIG. 89. Navigational bar 702 provides the user with an indication of where they are within the hierarchical menu structure. In some cases, adding a wireless device entails pressing a particular button on the remote device in order to establish wireless communication between HVAC controller 20 and the remote device. Screen 866 may include text 868 that instructs the user to press the designated button on the remote device. Text 870 may inform the user that they have a limited amount

of time to locate the remote device and press the designated button. Cancel button **762**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **856** (FIG. **88**).

If wireless communication between HVAC controller **20** and the remote device is not successfully established, HVAC controller **20** may display an illustrative screen **872**, as shown in FIG. **90**. Navigational bar **702** provides the user with an indication of where they are within the hierarchical menu structure. Screen **872** may include text **874** informing the user that the remote device was not found. Pressing Cancel button **762** may cause HVAC controller **20** to revert to a previous screen such as screen **856** (FIG. **88**). A Try Again button **876** permits the user to try once again to establish wireless communication between HVAC controller **20** and the wireless device. Pressing Try Again button **876** may cause HVAC controller **20** to revert to screen **866** (FIG. **89**).

If wireless communication between HVAC controller **20** and the remote device was successfully established, HVAC controller **20** may display an illustrative screen **878**, as shown in FIG. **91**. Navigational bar **702** provides the user with an indication of where they are within the hierarchical menu structure. Screen **878** may include text **880** informing the user that the remote device has been successfully added. In the illustrated example, the remote device was an Outdoor Sensor. Pressing Done button **752** may cause HVAC controller **20** to revert to screen **856** (FIG. **88**).

Returning briefly to FIG. **88**, pressing View Connected Devices button **860** may cause HVAC controller **20** to display an illustrative screen **882**, as shown in FIG. **92**. Navigational bar **702** provides the user with an indication of where they are within the hierarchical menu structure. Screen **882** may include a text box **884** that lists the devices that are wirelessly connected to HVAC controller **20**. In the illustrated example, HVAC controller **20** is connected wirelessly to an Outdoor Sensor, a Remote Control Unit and IAQ (Indoor Air Quality) equipment. Pressing Done button **752** may cause HVAC controller **20** to revert to screen **856** (Screen **88**).

Returning briefly to FIG. **88**, pressing Remove Device button **862** may cause HVAC controller **20** to display an illustrative screen **886**, as shown in FIG. **93**. Previous Menu button **704** may permit the user to return to a previous screen without removing any devices. Navigational bar **702** provides the user with an indication of where they are within the hierarchical menu structure. Screen **886** may include one or more of an Outdoor Sensor button **888**, a Remote Control button **890** and an IAQ equipment button **892**. The user may remove one of the connected devices by pressing the appropriate button.

For example, if the user presses Outdoor sensor button **888**, HVAC controller **20** may display an illustrative screen **894**, as shown in FIG. **94**. Navigational bar **702** provides the user with an indication of where they are within the hierarchical menu structure. Screen **894** may include an inquiry **896**, asking the user if they want to remove the Outdoor Sensor. A No button **898**, if pressed, will cause HVAC controller **20** to revert to screen **886** (FIG. **93**) without removing any devices. A Yes button **900**, if pressed, will cause HVAC controller **20** to remove, i.e., no longer communicate with, the Outdoor Sensor, and then to revert to screen **856** (FIG. **88**).

Returning briefly to FIG. **88**, pressing Rename Thermostat button **864** may cause HVAC controller **20** to display an illustrative screen **902**, as shown in FIG. **95**. Screen **902** provides a touch-sensitive QWERTY keyboard that the user may use to enter a new name for HVAC controller **20**. Cancel button **762**, if pressed, may cause HVAC controller **20** to revert to a previous screen without changing the name of

HVAC controller **20**. Once the new name has been typed, pressing Done button **752** may cause HVAC controller **20** to save the new name as well as to revert to screen **856** (FIG. **88**).

FIGS. **96** through **112** provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller **20** pertaining to viewing and/or changing temporary schedule changes within HVAC controller **20**. In particular, FIG. **96** provides an illustrative screen **904** that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Temporary Schedule Changes button **168** (FIG. **17**) in order to view and/or create temporary schedule changes.

Screen **904** may include Navigational bar **702**, which provides the user with an indication of where they are within the hierarchical menu structure. Previous Menu button **704** may permit the user to return to a previous screen while Help button **744** may provide the user with additional information or guidance. Screen **904** may include several schedule adjustment buttons that can be used for temporary schedule changes such as vacations, days off, sick days, sleeping in, staying up late, and the like.

In some instances, screen **904** may include one or more of a Vacation Mode button **906**, a Stay Home From Work button **908**, a Return Home Early button **910**, a Return Home Late button **912**, a Wake Up Early button **914**, a Stay Up Late button **916** and a View Schedule Adjustments button **918**. These are merely illustrative, as additional buttons such as a Sleep In button, a Go To Bed Early button, and the like may also be included even though they are not expressly illustrated herein. In some cases, as illustrated, there may be more schedule adjustment buttons than can be displayed at one time on screen **904**. An Up arrow **920** and a Down arrow **922** may be used as desired to scroll up and/or down through the displayed schedule adjustment buttons.

Vacation Mode button **906** may be used to provide HVAC controller **20** with information pertaining to the user's vacation schedule, including vacation start date, return home date, heating and cooling temperature set points during the vacation, and the like. In some cases, pressing Vacation Mode button **906** may bring the user to screen **472** (FIG. **47**), much the same as pressing Vacation Mode button **154** (FIG. **17**).

Returning briefly to FIG. **96**, pressing Stay Home From Work button **908** may cause HVAC controller **20** to display an illustrative screen **924**, as shown in FIG. **97**. Screen **924** may include text **926**, informing the user that they are to set the date that they plan to stay home from work. Screen **924** includes a month block **928** and a day block **930**. Month block **928** may display a month and may include an up arrow **932** and a down arrow **934** that can be used to change the month, if necessary. Day block **930** may display a date or a day of the week, which may be adjusted using up arrow **932** and down arrow **934**, as appropriate.

A Cancel button **936**, if pressed, may permit the user to exit screen **924** without setting a date for staying home from work. In some cases, HVAC controller **20** may revert to a previous screen such as screen **904** (FIG. **96**). A Done button **938** may be used by the user to inform HVAC controller **20** that they have entered the date on which they will be staying home from work. In some instances, pressing Done button **938** may cause HVAC controller **20** to display an illustrative screen **940**, as shown in FIG. **98**.

Screen **940** may include an inquiry **942**, asking the user to conform that they wish to adjust their schedule for the aforementioned date. Screen **940** includes a No button **944** and a Yes button **946** so that the user may provide their answer. If the user presses No button **944**, HVAC controller **20** will not save any information pertaining to a schedule adjustment. If

31

the user presses Yes button **946**, HVAC controller **20** saves the appropriate information. In either case, HVAC controller **20** may revert to a previous screen such as screen **904** (FIG. **96**).

Returning briefly to FIG. **96**, pressing Return Home Early button **910** may cause HVAC controller **20** to display an illustrative screen **948**, as shown in FIG. **99**. Screen **948** may include text **950**, instructing the user to set the date that they will be home early. Screen **948** includes month block **928** and day block **930**. Month block **928** may display a month that can be adjusted using up arrow **932** and down arrow **934**, if necessary. Day block **930** may display a date or a day of the week, which may be adjusted using up arrow **932** and down arrow **934**, as appropriate.

Cancel button **936**, if pressed, may permit the user to exit screen **948** without setting a date for returning home early. In some cases, HVAC controller **20** may revert to a previous screen such as screen **904** (FIG. **96**). A Next button **952**, if pressed, informs HVAC controller **20** that the date has been set, and thus HVAC controller **20** may then display an illustrative screen **954**, as shown in FIG. **100**. Screen **954** may include text **956** instructing the user that they are to enter the time that they will be returning home early. Screen **954** may include a time block **958** that may display a time that may be adjusted up and/or down using up arrow **932** and/or down arrow **934** as desired. A Back button **960** may be used, for example, if the user wants to return to a previous screen such as screen **948** (FIG. **99**).

Once the time has been set appropriately, pressing Next button **952** may cause HVAC controller **20** to display an illustrative screen **962**, as shown in FIG. **101**. Screen **962** may include an inquiry **964**, asking the user to confirm their schedule change. In some cases, screen **962** may be displayed when a user presses Next button **952** after setting a date and time for returning home early, waking up early, staying up late, and the like. If the user presses No button **944**, HVAC controller **20** will not save any information pertaining to a schedule adjustment. If the user presses Yes button **946**, HVAC controller **20** saves the appropriate information. In either case, HVAC controller **20** may revert to a previous screen such as screen **904** (FIG. **96**).

Returning briefly to FIG. **96**, pressing Return Home Late button **912** may cause HVAC controller **20** to display an illustrative screen **966**, as shown in FIG. **102**. Screen **966** may include text **968**, instructing the user that they are to set the date that they will be returning home late. Screen **966** includes month block **928** and day block **930**. Month block **928** may display a month that can be changed using up arrow **932** and down arrow **934**, if necessary. Day block **930** may display a date or a day of the week, which may be adjusted using up arrow **932** and down arrow **934**, as appropriate.

Cancel button **936**, if pressed, may permit the user to exit screen **966** without setting a date for returning home late. In some cases, HVAC controller **20** may revert to a previous screen such as screen **904** (FIG. **96**). Next button **952**, if pressed, informs HVAC controller **20** that the date has been set, and thus HVAC controller **20** may then display an illustrative screen **970**, as shown in FIG. **103**.

Screen **970** may include text **972** instructing the user that they are to enter the time that they will be returning home late. Screen **970** may include a time block **974** that may display a time that may be adjusted up and/or down using up arrow **932** and/or down arrow **934** as desired. Back button **960** may be used, for example, if the user wants to return to a previous screen such as screen **966** (FIG. **102**). Once the time has been set appropriately, pressing Next button **952** may cause HVAC controller **20** to display illustrative screen **962**, as shown in FIG. **101** and as previously discussed.

32

Returning briefly to FIG. **96**, pressing Wake Up Early button **914** may cause HVAC controller **20** to display an illustrative screen **976**, as shown in FIG. **104**. Screen **976** may include text **978**, instructing the user that they are to set the date that they will be waking up early. Screen **976** includes month block **928** and day block **930**. Month block **928** may display a month that may be adjusted using up arrow **932** and/or down arrow **934**, if necessary. Day block **930** may display a date or a day of the week, which may be adjusted using up arrow **932** and down arrow **934**, as appropriate.

Cancel button **936**, if pressed, may permit the user to exit screen **976** without setting a date for waking up early. In some cases, HVAC controller **20** may revert to a previous screen such as screen **904** (FIG. **96**). Next button **952**, if pressed, informs HVAC controller **20** that the date has been set, and thus HVAC controller **20** may then display an illustrative screen **980**, as shown in FIG. **105**.

Screen **980** may include text **982** instructing the user that they are to enter the time that they will be waking up early. Screen **980** may include a time block **984** that may display a time that may be adjusted up and/or down using up arrow **932** and/or down arrow **934** as desired. Back button **960** may be used, for example, if the user wants to return to a previous screen such as screen **976** (FIG. **104**). Once the time has been set appropriately, pressing Next button **952** may cause HVAC controller **20** to display illustrative screen **962**, as shown in FIG. **101** and as previously discussed.

Returning briefly to FIG. **96**, pressing Stay Up Late button **916** may cause HVAC controller **20** to display an illustrative screen **984**, as shown in FIG. **106**. Screen **984** may include text **986**, instructing the user that they are to set the date that they will be staying up late. Screen **984** includes month block **928** and day block **930**. Month block **928** may display a month that may be adjusted using up arrow **932** and/or down arrow **934**, if necessary. Day block **930** may display a date or a day of the week, which may be adjusted using up arrow **932** and down arrow **934**, as appropriate.

Cancel button **936**, if pressed, may permit the user to exit screen **984** without setting a date for staying up late. In some cases, HVAC controller **20** may revert to a previous screen such as screen **904** (FIG. **96**). Next button **952**, if pressed, informs HVAC controller **20** that the date has been set, and thus HVAC controller **20** may then display an illustrative screen **988**, as shown in FIG. **107**.

Screen **988** may include text **990** instructing the user that they are to enter the time that they will be staying up late. Screen **988** may include a time block **992** that may display a time that may be adjusted up and/or down using up arrow **932** and/or down arrow **934** as desired. Back button **960** may be used, for example, if the user wants to return to a previous screen such as screen **984** (FIG. **106**). Once the time has been set appropriately, pressing Next button **952** may cause HVAC controller **20** to display illustrative screen **962**, as shown in FIG. **101** and as previously discussed.

Returning briefly to FIG. **96**, pressing View Schedule Adjustments button **918** may cause HVAC controller **20** to display an illustrative screen **994**, shown in FIG. **108**. Navigational bar **702** provides the user with an indication of where they are within the hierarchical menu structure. Screen **994** may include buttons representing each temporary schedule change that has been saved. In some cases, there may be more such buttons than can be displayed at one time. An Up arrow **996** and a Down arrow **998** may be used to scroll up and/or down through the buttons representing the temporary schedule changes, if necessary.

In the illustrated example, screen **994** includes a first button **1000** and a second button **1002**. First button **1000** represents

a temporary schedule change in which the user has specified that they will be staying home from work. Second button **1002** represents a temporary schedule change in which the user has specified that they will be coming home from work early. Screen **994** permits the user to not only view their temporary schedule changes, but also to edit and/or delete them, as they wish. Screen **994** includes an Edit button **1004**, a Help button **1006**, a Cancel button **1008** and a Done button **1010**. By pressing one of first button **1000** or second button **1002**, the user may be able to either edit or cancel the temporary schedule change represented by the pressed button. Help button **1006**, if pressed, may cause HVAC controller **20** to display information providing further assistance and/or guidance. Pressing Done button **1010** may cause HVAC controller **20** to revert to a previous screen such as screen **904** (FIG. **96**). It is contemplated that an Add button may also be provided, which when selected, provides a screen similar to that shown in FIG. **96**.

For illustrative purposes, assume that second button **1002** has been selected. If the user presses Edit button **1004**, HVAC controller **20** may display an illustrative screen **1012**, as shown in FIG. **109**. Screen **1012** may include text **1014**, instructing the user that they are to set the date that they will be returning home early. Screen **1012** may include month block **928** and day block **930**. Month block **928** may display a month that can be adjusted using up arrow **932** and down arrow **934**, if necessary. Day block **930** may display a date or a day of the week, which may be adjusted using up arrow **932** and down arrow **934**, as appropriate. Back button **960** may cause HVAC controller **20** to revert to a previous screen such as screen **994** (FIG. **108**).

Pressing Next button **952** may cause HVAC controller **20** to display an illustrative screen **1016**, as shown in FIG. **110**. Screen **1016** may include text **1018**, instructing the user that they are to set the time that they will be returning home early. Screen **1016** may include a time block **1020** that displays a time that can be adjusted up or down using up arrow **932** and/or down arrow **934**, as desired. Back button **960** may cause HVAC controller **20** to revert to a previous screen such as screen **1012** (FIG. **109**).

Pressing Done button **952** may cause HVAC controller **20** to display an illustrative screen **1022**, as shown in FIG. **111**. Screen **1022** may include an inquiry **1024**, asking the user to confirm if they wish to save the schedule change or changes they have just made. Pressing Back button **960** may cause HVAC controller **20** to revert to a previous screen such as screen **1012** (FIG. **109**) or screen **1016** (FIG. **110**) so that the user may have another opportunity to edit the temporary schedule change. A Yes button **1026**, if pressed, instructs HVAC controller **20** to save the changes made and to revert to a previous screen such as screen **994** (FIG. **108**).

Returning briefly to FIG. **108**, pressing Cancel button **1008** may cause HVAC controller **20** to display an illustrative screen **1028**, as shown in FIG. **112**. Screen **1028** may include an inquiry **1030**, asking the user to confirm that they wish to cancel the selected temporary schedule change. A No button **1032** and a Yes button **1034** permit the user to provide their answer. Pressing No button **1032** may cause HVAC controller **20** to retain the temporary schedule change while pressing Yes button may cause HVAC controller **20** delete the temporary schedule change. In either case, HVAC controller **20** may revert to screen **994** (FIG. **108**).

FIGS. **113** through **114** provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller **20** pertaining to viewing and/or changing a fan schedule within HVAC controller **20**. In particular, FIG. **113** provides an illustrative screen **1036** that may be displayed by

HVAC controller **20** in response to someone pressing or otherwise selecting Schedule Fan button **170** (FIG. **17**) in order to view and/or create a fan schedule. Screen **904** may include a Navigational bar **1038**, which provides the user with an indication of where they are within the hierarchical menu structure. Text **1040** may instruct the user to set the fan operation schedule for each of the time periods shown.

Screen **1036** may include, for example, one or more of a Wake button **1042**, a Leave button **1044**, a Return button **1046** and a Sleep button **1048**. Each of Wake button **1042**, Leave button **1044**, Return button **1046** and Sleep button **1048** may display a fan setting for that particular time period. For example, as currently set, screen **1036** shows a Run Continuously setting for the Wake period, an Intermittent setting for the Leave period, an Automatic setting for the Return period and a Run Continuously setting for the Sleep period. A Back button **1050**, if pressed, may cause HVAC controller **20** to return to a previous screen without saving any changes to the fan schedule. A Done button **1052**, if pressed, may cause HVAC controller **20** to return to a previous screen and to save any changes that were made to the fan schedule. In some cases, HVAC controller **20** may revert to a previous screen such as screen **150** (FIG. **17**).

If the user wants to change the fan setting for one of the time periods, they may do so by pressing the appropriate button. For example, pressing Wake button **1042** may cause HVAC controller **20** to display an illustrative screen **1054**, as shown in FIG. **114**. Screen **1054** may include Navigational bar **1038**, which provides the user with an indication of where they are within the hierarchical menu structure. Screen **1054** includes text **1056**, instructing the user to set the fan setting for the Wake time period. Screen **1054** includes a Run Continuously button **1058**, an Automatic button **1060**, and an Intermittent button **1062**. Although not illustrated, it is contemplated that screen **1054** may also include a fan setting button that instructs HVAC controller **20** to operate the fan any time the ventilation system (air exchanger) is operating and/or at some other designated time.

By pressing the appropriate fan operation button, the user may instruct HVAC controller **20** how to operate the fan in any particular time period. Pressing Back button **1050** may cause HVAC controller **20** to return to screen **1036** (FIG. **113**) without saving any changes while pressing Done button **1052** may cause HVAC controller **20** to save the changes made as well as to revert to a previous screen such as screen **150** (FIG. **17**).

FIG. **115** provides an illustrative but non-limiting example of a screen that may be displayed by HVAC controller **20** pertaining to locating a remote control. In particular, FIG. **115** provides an illustrative screen **1064** that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Find Remote button **174** (FIG. **17**). Screen **1064** may include a Navigational bar **1038**, which provides the user with an indication of where they are within the hierarchical menu structure. Text **1066** may instruct the user to wait while the remote is being located. A timer **1068** provides a countdown for finding the remote. In some cases, the remote control may beep in response to the user pressing Find Remote button **172**.

FIGS. **116** through **117** provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller **20** pertaining to screen cleaning. In particular, FIG. **116** provides an illustrative screen **1070** that may be displayed by HVAC controller **20** in response to someone pressing or otherwise selecting Clean Screen button **176** (FIG. **17**). Screen **1070** may include Navigational bar **1038**, which provides the user with an indication of where they are within the

35

hierarchical menu structure. An inquiry 1072 may ask the user if they want to deactivate the touch screen so that it can be cleaned. If the user presses a Back button 1074, HVAC controller 20 may revert to a previous screen such as screen 150 (FIG. 17).

If the user presses a Yes button 1076, HVAC controller 20 may display an illustrative screen 1078, as shown in FIG. 117. Screen 1078 may include text 1080 instructing the user to proceed with cleaning the screen. In some cases, text 1080 may also provide the user with instructions as to how to clean the screen, what type or kind of cloth and/or cleaner or solvent to use, and the like. A counter 1082 may count backwards from a predetermined time such as 30 seconds so that the user knows when they need to finish cleaning the screen.

FIGS. 118 through 123 provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller 20 pertaining to viewing and/or changing security settings within HVAC controller 20. In particular, FIG. 118 provides an illustrative screen 1084 that may be displayed by HVAC controller 20 in response to someone pressing or otherwise selecting Security Settings button 178 (FIG. 17) in order to view and/or alter security settings. Screen 1084 may include a Navigational bar 1086, which provides the user with an indication of where they are within the hierarchical menu structure. Text 1088 may instruct the user to enter their password.

It should be noted that HVAC controller 20 may display screen 1084 upon the user pressing Security Settings button 178 (FIG. 17) if the user has already created a password. In some cases, if no password has been created, pressing Security Settings button 178 may cause HVAC controller 20 to display a preferences screen as will be discussed with respect to FIG. 120. In some instances, if the user has not already set a password, HVAC controller 20 may default to an initial password such as "9999" which can be entered via screen 1084 so that the user may subsequently set their own password.

Screen 1084 includes a password block 1090 that may be used to enter a password. As illustrated, password block 1090 is configured to accommodate a four digit numerical password. It will be recognized that password block 1090 may easily be configured to accommodate smaller or even larger numerical password, or to include one or more letters of the alphabet. Password block 1090 may be configured to represent a four digit lock tumbler including a first digit location 1092, a second digit location 1094, a third digit location 1096 and a fourth digit location 1098. Each digit location may display a number and may include an up arrow 1100 and a down arrow 1102 that may be used to adjust the displayed number.

A Cancel button 1104, if pressed, may permit the user to return to a previous screen. A Done button 1106, if pressed, informs HVAC controller 20 that the password has been entered. If the password is not correct, HVAC controller 20 may display an illustrative screen 1108, as shown in FIG. 119. Navigational bar 1086 provides the user with an indication of where they are within the hierarchical menu structure. Screen 1108 may include text 1110, which informs the user that the password was not entered correctly and that they should try again. Pressing a Back button 1112 may cause HVAC controller 20 to revert to a previous screen such as screen 1084 (FIG. 118).

Referring briefly to FIG. 118, if the password was entered correctly, pressing Done button 1106 may cause HVAC controller 20 to display an illustrative screen 1114, as shown in FIG. 120. Navigational bar 1086 provides the user with an indication of where they are within the hierarchical menu

36

structure. A Previous Menu button 1116, if pressed, may cause HVAC controller 20 to revert to a previous screen such as screen 150 (FIG. 17). Screen 1114 may include, for example, one or more of a Change Lock Mode button 1118, a Create Password button 1120, a Change Password button 1122, and a Remove Password button 1124. Screen 1114 may not display all of these buttons at one time. For example, if no password has yet been created, screen 1114 will likely not include Change Password button 1122 or Remove Password button 1124. If a password has already been created, Create Password button 1120 may not be displayed.

Returning briefly to FIG. 120, pressing Change Lock Mode button 1118 may cause HVAC controller 20 to display an illustrative screen 1126, as shown in FIG. 121. Navigational bar 1086 provides the user with an indication of where they are within the hierarchical menu structure. A Help button 1128 may provide the user with additional guidance or information pertaining to their options. Screen 1126 may include one or more of an Unlocked button 1130, a Partial Lockout button 1132 and a Full Lockout button 1134.

The user may select their desired lock mode by pressing one of Unlocked button 1130, Partial Lockout button 1132 and Full Lockout button 1134. Pressing Cancel button 1104 may cause HVAC controller 20 to discard any selection that may have been made, while pressing Done button 1106 may cause HVAC controller 20 to remember any selection that may have been made. In either case, HVAC controller 20 may revert to a previous screen such as screen 1114 (FIG. 120).

In one illustrative embodiment, Full Lockout may require that the user enter a password to make any (or most) changes to the HVAC controller settings. Partial Lockout may require a password to change certain settings, such as system settings. Unlock may not require a password to make any changes.

Returning briefly to FIG. 120, pressing Create Password button 1120 may cause HVAC controller 20 to display an illustrative screen 1136, as shown in FIG. 122. As can be seen within Navigational bar 1086, screen 1136 pertains to creating a password. If a password has already been created or if a default password is built into HVAC controller 20, a screen similar to screen 1136 may be reached, for example, by pressing Change Password button (FIG. 120).

Screen 1136 may include Password block 1090, which as discussed above may be configured to represent a four digit lock tumbler including first digit location 1092, second digit location 1094, third digit location 1096 and fourth digit location 1098. Each digit location may display a number and may include up arrow 1100 and down arrow 1102 that may be used to adjust the displayed number. A Cancel button 1104, if pressed, may permit the user to return to a previous screen. A Done button 1106, if pressed, informs HVAC controller 20 that the password has been entered.

Returning briefly to FIG. 120, if a password has previously been created and thus Remove Password button 1124 is displayed, pressing Remove Password button 1124 may cause HVAC controller 20 to display an illustrative screen 1138, as shown in FIG. 123. Navigational bar 1086 provides the user with an indication of where they are within the hierarchical menu structure. Screen 1138 may include an inquiry 1140, asking the user if they want to remove password protection. A No button 1142 and a Yes button 1144 permit the user to enter their choice. If the user presses No button 1142, the password is retained while if the User presses Yes button 1144, the password is removed. In either case, HVAC controller 20 may revert to a previous screen such as screen 1114 (FIG. 120).

FIGS. 124 through 195 provide illustrative but non-limiting examples of screens that may be displayed by HVAC controller 20 pertaining to installer setup of HVAC controller

20. In particular, FIG. 124 provides an illustrative screen 1200 that may be displayed by HVAC controller 20 in response to someone pressing or otherwise selecting Installer Setup button 180 (FIG. 17) in order to access the installer setup menu. While it is contemplated that a homeowner may access the installer setup, the installer setup menu will likely be accessed by an installer or other HVAC contractor.

Screen 1200 may include a Navigational bar 1202, which provides the user with an indication of where they are within the hierarchical menu structure. Screen 1200 may include text 1204 instructing the installer that they are entering installer setup. An inquiry 1206 may ask the installer to confirm that they want to continue. If the installer does not want to continue into installer setup, they can return to a previous screen such as screen 150 (FIG. 17) by pressing a Cancel button 1208. However, if they wish to advance into installer setup, they may do so by pressing a Next button 1210, which may cause HVAC controller 20 to display an illustrative screen 1212, as shown in FIG. 125.

Screen 1212 provides an installer, HVAC contractor or other professional the opportunity to create a setup, view or edit a current setup, test the HVAC equipment and/or reach advanced installer setup options. Screen 1212 may include one or more of View/Edit Current Installer Setup button 1214, a Create Setup button 1216, an Installer Test button 1218 and an Advanced Options button 1220. A Back button 1222, if pressed, may cause HVAC controller 20 to revert to a previous screen such as screen 150 (FIG. 17). A Help button 1224 may provide the installer with additional information or guidance pertaining to their options. In some cases, the installer setup may be password protected.

Pressing Create Setup button 1216 may cause HVAC controller 20 to begin an installer setup process. In some case, HVAC controller 20 may display one or more screens (not illustrated) asking the installer to set parameters such as a language in which they want HVAC controller 20 to present questions and in which HVAC controller 20 receives answers. The following screens provide examples of screens that may be displayed by HVAC controller 20 during the installer setup process but they should not be construed as being limiting in any manner. Depending on the particular HVAC equipment that will be controlled by HVAC controller 20, more or fewer screens may be displayed, depending on the circumstances.

As illustrated, pressing Create Setup button 1216 may cause HVAC controller 20 to display an illustrative screen 1226, as shown in FIG. 126. Screen 1226 may include a banner 1228 that provides the installer with an indication of where they are within the menu structure as well as providing a numerical key. The numerical key may, for example, correspond to known thermostat programming numbers with which an installer may be familiar, although this is not required.

Text 1230 instructs the installer that they are to edit a device name. A Thermostat button 1232 may be pressed to edit the name of the thermostat. In some cases, additional buttons (not illustrated) may be provided, so that the user may edit the names, if desired, of multiple devices. Back button 1222 permits the user to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. A Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer setup process and revert to a previous screen such as screen 1212 (FIG. 125) while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the Create Setup menu.

Pressing Thermostat button 1232 may cause HVAC controller 20 to display an illustrative screen 1238, as shown in

FIG. 127. Screen 1238 may include text 1240, reminding the installer that they are to enter a name for the device in question. Screen 1238 may provide a touch-sensitive QWERTY keyboard that the installer may use to enter the new name. Done button 1234 may, in this case, instruct HVAC controller 20 to save the newly entered name as well as to proceed to the next screen in the installer setup process. In some instances, pressing Done button 1234 may cause HVAC controller 20 to display an illustrative screen 1242, as shown in FIG. 128.

Screen 1242 may include banner 1228, which as noted above provides the installer with an indication of menu location as well as a reminder that they are to set the date. Screen 1242 may include one or more of a Month block 1244, a Day block 1246 and a Year block 1248. Month block 1244 may display a month and may include an up arrow 1250 and a down arrow 1252 that can be used to change the month, if necessary. Day block 1246 may display a day or a date that can be adjusted using up arrow 1250 and/or down arrow 1252, as desired. Year block 1248 may display a year that can be adjusted using up arrow 1250 and/or down arrow 1252, as appropriate.

Back button 1222 permits the installer to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer setup process and revert to a previous screen such as screen 1212 (FIG. 125), while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the Create Setup menu. In some cases, pressing Next button 1236 may cause HVAC controller 20 to display an illustrative screen 1254, as shown in FIG. 129.

Screen 1254 may include banner 1228, which as noted provides the installer with an indication of menu location as well as a reminder that they are to set the time. Screen 1254 may include one or more of a Hour block 1256, a Minute block 1258 and an AM/PM block 1260. Hour block 1256 may display a current hour time setting that may be adjusted using up arrow 1250 and/or down arrow 1252, as desired. Minute block 1258 may display a current minute time setting that can be increased or decreased using up arrow 1250 and/or down arrow 1252, as appropriate. AM/PM block 1260 may display an indication of whether the current time is AM or PM. Up arrow 1250 and/or down arrow 1252 may be used to adjust whether the current time is before noon or after noon.

Back button 1222 permits the installer to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer setup process and revert to a previous screen such as screen 1212 (FIG. 125), while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button 1236 may cause HVAC controller 20 to display an illustrative screen 1262, as shown in FIG. 130. Screen 1262 may include banner 1228, which provides the installer with an indication of menu location. Screen 1262 may permit the installer to specify equipment type. In some cases, screen 1262 may include one or more of a Conventional button 1264, a Heat Pump button 1266 and a Heat Only, No Fan button 1268. The installer may instruct HVAC controller 20 which type of equipment is or will be controlled by HVAC controller 20 by pressing the appropriate equipment button. While only three equipment buttons are shown, it will be appreciated that in some instances there may be more equipment buttons than can be displayed at one time. Screen 1262 may, therefore, include an

Up button **1270** and a Down button **1272** that can be used to scroll up and/or down through the displayed equipment buttons.

Back button **1222** permits the installer to revert to a previous screen, while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1274**, as shown in FIG. **131**. Screen **1274** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide data pertaining to the number of heating stages and the number of cooling stages. Screen **1274** may include one or both of a Heat Stages block **1276** and a Cool Stages block **1278**. Heat Stages block **1276** may display a number of heating stages that can be increased or decreased using up arrow **1250** and/or down arrow **1252**, as desired. Cool Stages block **1278** may display a number of cooling stages that can be increased or decreased using up arrow **1250** and/or down arrow **1252**, as desired. HVAC controller **20** may be intelligent enough so that only options relevant to the equipment that is installed are provided in the menu. For example, if a single stage heat source is to be used, the Heat Stages block **1276** may not be provided or may be grayed out.

In some instances, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1274**, a first setup parameter may be the number of heating stages, and the first descriptive text may be the text “Heat Stages” displayed immediately above Heat Stages block **1276**. A second setup parameter may be the number of cooling stages, and the second descriptive text may be the text “Cooling Stages” displayed immediately above Cool Stages block **1278**.

These related parameters may be organized into a common setup category and displayed on the same screen **1274**. The number of heating stages and the number of cooling stages, while applicable to different HVAC equipment, are related to a common setup category as to they both specify the number of stages. Grouping and displaying such related parameters into common setup category clusters on the display is believed to make the setup process more intuitive and efficient for the installer. Example common setup categories can include, for example, number of stages of an HVAC system, indoor air quality equipment parameters, heat pump lockout temperatures, humidity control parameters, ventilation parameters, cycles per hour (CPH) parameters, temperature set point stop limits, minimum off times, minimum on times, extended fan on times, display temperature offsets, and/or any other category as desired.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1280**, as shown in FIG. **132**. Screen **1280** may include banner **1228**,

which provides the installer with an indication of menu location and in this case informs the installer that they are to provide data pertaining to the number of cycles per hour while cooling. Screen **1280** may include one or more of a Stage 1 block **1282** and a Stage 2 block **1284**.

In the illustrative embodiment, Stage 1 block **1282** may display a number of cycles per hour for first stage cooling, which can be adjusted using up arrow **1250** and/or down arrow **1252**, as desired. Stage 2 block **1284** may display a number of cycles per hour for second stage cooling, which can be adjusted using up arrow **1250** and/or down arrow **1252**, as desired. In some cases, and as specified with respect to screen **1274** (FIG. **131**), there may be more than two cooling stages, or perhaps less than two cooling stages, and screen **1280** may accommodate this.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1280**, a first setup parameter may be the number of cycles per hour for the first cooling stage, and the first descriptive text may be the text “Stage 1” displayed immediately above Stage 1 block **1282**. A second setup parameter may be the number of cycles per hour for the second cooling stage, and the second descriptive text may be the text “Stage 2” displayed immediately above Stage 2 block **1284**. These related parameters may be grouped into a common setup category and displayed on the same screen **1280**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1286**, as shown in FIG. **133**. Screen **1286** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide data pertaining to the number of cycles per hour while heating. Screen **1286** may include one or more of a Stage 1 block **1288**, a Stage 2 block **1290** and a Stage 3 block **1292**.

In the illustrative embodiment, Stage 1 block **1288** may display a number of cycles per hour for first stage heating, which can be adjusted using up arrow **1250** and/or down arrow **1252**, as desired. Stage 2 block **1290** may display a number of cycles per hour for second stage heating, which can be adjusted using up arrow **1250** and/or down arrow **1252**, as desired. Stage 3 block **1292** may display a number of cycles per hour for third stage heating, which can be adjusted using up arrow **1250** and/or down arrow **1252**, as appropriate. In some cases, and as specified with respect to screen **1274** (FIG. **131**), there may be more than three heating stages, or perhaps less than three heating stages, and screen **1286** may accommodate this.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1286**, a first setup parameter may be the number of cycles per hour for the first heating stage, and the first descriptive text may be the text “Stage 1” displayed immediately above Stage 1 block **1288**. A second setup parameter may be the number of cycles per hour for the second heating stage, and the second descriptive text may be

the text “Stage 2” displayed immediately above Stage 2 block **1290**. These related parameters may be organized into a common setup category and displayed on the same screen **1286**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1294**, as shown in FIG. **134**. Screen **1294** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide data pertaining to fan settings. Screen **1294** may include, for example, one or more of a No Fan Operation button **1296**, a Fan On With All Stages button **1298** and a Fan On With Stage 2 and 3 button **1300**.

The installer may indicate their choice by pressing the appropriate fan setting button. While only three fan setting buttons are shown, it will be appreciated that in some instances there may be more fan setting buttons than can be displayed at one time. Screen **1294** may, therefore, include Up button **1270** and Down button **1272** that can be used to scroll up and/or down through the displayed fan setting buttons. Less fan setting buttons may also be displayed.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1302**, as shown in FIG. **135**. Screen **1302** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the user that they are to provide data pertaining to a reversing valve. In some cases, screen **1302** may only be displayed if HVAC controller **20** was previously instructed that there was a heat pump, with respect to screen **1262** (FIG. **13**). Screen **1302** may include an O button **1304** and a B button **1306**. The installer may, for example, press O button **1304** if they want the reversing valve to reverse on cooling or they may press B button **1306** if they want the reversing valve to reverse on heating.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1308**, as shown in FIG. **136**. Screen **1308** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to a back-up heat source, if there is one. If there is no back-up heat source, HVAC controller **20** may not display screen **1308**. Illustrative screen **1308** may include an Electric button **1310** and a Fossil button

1312. The installer may press one of Electric button **1310** or Fossil button **1312** to instruct HVAC controller **20** appropriately.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1314**, as shown in FIG. **137**. Screen **1314** may, for example, only be displayed if the installer indicated with respect to screen **1308** (FIG. **136**) that there was a fossil fuel back-up heat source. Screen **1314** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to tell HVAC controller **20** whether or not there is an external fossil fuel kit. Screen **1314** may include a No button **1316** and a Yes button **1318**. The installer may press No button **1316** if there is no external fossil fuel kit and may press Yes button **1318** if there is.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1320**, as shown in FIG. **138**. Screen **1320** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to tell HVAC controller **20** whether or not there is an outdoor sensor. Screen **1320** may include a None button **1322** and a Remote button **1324**. The installer may press None button **1322** if there is no outdoor sensor and may press Remote button **1324** if there is. In some cases, None button **1322** may instead be labeled “No” while Remote button **1324** may be labeled as “Yes”.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1326**, as shown in FIG. **139**. Screen **1326** may, for example, only be displayed if the installer has previously indicated with respect to screen **1262** (FIG. **130**) that there is a heat pump. Screen **1326** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to dual fuel heat pump control. Screen **1326** may include, for example, one or more of a Balance Point Only button **1328**, a Balance Point Plus 2° F. Droop button **1330** and a Balance Point and Aux Lockout Plus 2° F. Droop button **1332**. The installer may press the appropriate button.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their

43

options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1334**, as shown in FIG. **140**. Screen **1334** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to the upstage to furnace timer. Screen **1334** may include an Upstage Time block **1336**. Upstage Timer block **1336** may display a time and may also display the time units being used (minutes, in the illustrated example). Up arrow **1250** and/or Down arrow **1252** may be used to increase and/or decrease the upstage to furnace timer value.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1338**, as shown in FIG. **141**. Screen **1338** may, for example, only be displayed if the installer has previously indicated with respect to screen **1262** (FIG. **130**) that there is a heat pump. Screen **1338** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to heat pump lockouts.

Screen **1338** may include a Compressor Lockout block **1340** and an Aux Lockout block **1342**. Compressor Lockout block **1340** may display a compressor lockout value such as a value given in degrees, which can be increased or decreased, as desired, using Up arrow **1250** and/or Down arrow **1252**. Aux Lockout block **1342** may display an Aux lockout value such as a value given in degrees, which can be increased or decreased, as desired, using Up arrow **1250** and/or Down arrow **1252**.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1338**, a first setup parameter may be the compressor lockout value, and the first descriptive text may be the text "Compressor Lockout" displayed immediately above Compressor Lockout block **1340**. A second setup parameter may be the number of auxiliary lockout value, and the second descriptive text may be the text "Aux Lockout" displayed immediately above Aux Lockout block **1342**. These related parameters may be organized into a common setup category and displayed on the same screen **1338**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1342**, as

44

shown in FIG. **142**. Screen **1342** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to changeover settings. The installer may, for example, use screen **1342** to instruct HVAC controller **20** how changeovers between heating and cooling are to be handled, as well as a dead band setting. In some cases, if the installer selects manual changeover, there may not be a dead band setting to make or adjust.

Screen **1342** may include a Manual Changeover button **1344** and an Automatic Changeover button **1346**. If the installer wants the user to have to manually switch HVAC controller **20** between heating mode and cooling mode as shown with respect to screen **134** (FIG. **15**), the installer will press Manual Changeover button **1344**. However, if the installer wants HVAC controller **20** to automatically switch between heating and cooling, the installer will press Automatic Changeover button **1346**. This may be useful, for examples, in environments that may undergo large temperature swings on a daily basis.

Screen **1342** may include a Dead band block **1348**, which displays a dead band value. In the illustrated example, this is displayed in degrees Fahrenheit. Up arrow **1250** and/or Down arrow **1252** may be used to increase or decrease the dead band value, as desired. The dead band value represents a minimum difference between a heating temperature set point and a cooling temperature set point and may be particularly relevant if HVAC controller **20** is operating in accordance with automatic changeover between heating and cooling and vice versa.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1350**, as shown in FIG. **143**. Screen **1350** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to humidification equipment. Screen **1350** may include, for example, one or more of a None button **1352**, an Internal Relay button **1354** and a Remote RF button **1356**. None button **1352** may be pressed if there is no humidification equipment. Internal Relay button **1354** and/or Remote RF button **1356** may be used if there is humidification equipment, and may specify how HVAC controller **20** will be communicating with the humidification equipment.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1358**, as shown in FIG. **144**. Screen **1358** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to humidification control. Screen **1358** may include, for example, a Disabled button **1360** and an Enabled button **1362** that can be used to specify

45

if humidification is disabled or enabled as well as a Disabled button **1364** and an Enabled button **1366** that can be used to specify if frost protection is disabled or enabled. These settings may, for example, affect whether or not HVAC controller **20** provides particular options to the user.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1368**, as shown in FIG. **145**. Screen **1368** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to humidification fan action. Screen **1368** may include, for example, one or more of a Humidification Force Fan button **1370**, an Only Humidify With Heat button **1372** and a Humidify Independent of Fan button **1374**. The installer may use screen **1368** to instruct HVAC controller **20** when and/or how to humidify by pressing the appropriate humidification button. While only three humidification buttons are shown, it will be appreciated that in some instances there may be more humidification buttons than can be displayed at one time. Screen **1368** may, therefore, include Up button **1270** and Down button **1272** that can be used to scroll up and/or down through the displayed humidification buttons.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1376**, as shown in FIG. **146**. Screen **1376** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to dehumidification equipment. Screen **1376** may include one or more of a None button **1378**, a Dehumidify With A/C button **1380** and a Whole House Dehumidifier button **1382**. If there is no equipment provided for dehumidification, the installer may press None button **1378**. If the only option is to use the air conditioning to dehumidify, the installer may press Dehumidify With A/C button **1380**. However, if there is a separate dehumidifier, the installer may press Whole House Dehumidifier button **1382**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1384**, as shown in FIG. **147**. Screen **1384** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to the Over Cooling Limit.

46

Screen **1384** may include an Over Cooling Limit block **1386**, which may display a setting value for the Over Cooling Limit. Up arrow **1250** and/or down arrow **1252** may be used to increase and/or decrease the displayed value, as desired.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1388**, as shown in FIG. **148**. Screen **1388** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to dehumidification fan action. Screen **1388** may include one or more of a Dehumidification Forces Fan On button **1390** and a Dehumidify Independent of Fan button **1392**. The installer may press the appropriate button to instruct HVAC controller **20** accordingly.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1394**, as shown in FIG. **149**. Screen **1394** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to the dehumidification away mode. Screen **1394** may include a Disabled button **1396** and an Enabled button **1398**. The installer may press the appropriate button to specify whether the dehumidification away mode is enabled or disabled.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1400**, as shown in FIG. **150**. Screen **1400** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to dehumidification away fan action. Screen **1400** may include one or more of an Auto button **1402**, an On button **1404** and a Circulate button **1406**. The installer may press the appropriate button to specify how HVAC controller **20** should act during the dehumidification away mode.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next

button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1408**, as shown in FIG. **151**. Screen **1408** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to heat pump lockouts. Screen **1408** may include one or more of a Temperature Low Limit block **1410**, a Temperature Setting block **1412** and a Dehumidification Setting block **1414**, each of which may include Up arrow **1250** and Down arrow **1252**. The installer may adjust one or more of a temperature low limit, a temperature setting and/or a dehumidification setting by adjusting the displayed values up and/or down using Up arrow **1250** and/or Down arrow **1252**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1416**, as shown in FIG. **152**. Screen **1416** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to ventilation control. Screen **1416** may include one or more of an Off button **1418**, a Ventilation Always Allowed button **1420** and a Ventilation Disabled in Sleep button **1422**. The installer may set the desired ventilation control by pressing one Off button **1418**, Ventilation Always Allowed button **1420** and Ventilation Disabled in Sleep button **1422**, as appropriate.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1424**, as shown in FIG. **153**. Screen **1424** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to ventilation house size. In some cases, ventilation rates may be determined based at least partially upon the number of bedrooms within a house and/or the physical size of the house. Other physical parameters related to the house or other structure are also contemplated.

In the illustrative embodiment, screen **1424** may include one or more of a Bedroom Number block **1426** and a House Size block **1428**. Bedroom Number block **1426** may display a number of bedrooms that can be adjusted up and/or down, as desired, using Up arrow **1250** and/or Down arrow **1250**. House Size block **1428** may display a house size (in square feet) that can be adjusted up and/or down, as desired, using Up arrow **1250** and/or Down arrow **1250**.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1424**, a first setup param-

eter may be the number of bedrooms, and the first descriptive text may be the text “Number of Bedrooms” displayed immediately above Bedroom Number block **1426**. A second setup parameter may be the house size, and the second descriptive text may be the text “Size of House” displayed immediately above House Size block **1428**. These related parameters may be organized into a common setup category and displayed on the same screen **1424**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1430**, as shown in FIG. **154**. Screen **1430** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to ventilation levels. In some cases, ventilation rates may be determined based at least partially upon a ventilation level (in cubic feet per minute) and/or a percentage of a maximum ventilation rate. The ventilation rates may also, in some cases, depend on the parameters specified in FIG. **153** as well as other parameters, if desired.

In the illustrative embodiment, screen **1430** may include one or more of a Ventilation Level block **1432** and a Max Ventilation Limit block **1434**. Ventilation Level block **1432** may display a ventilation rate that can be adjusted up and/or down, as desired, using Up arrow **1250** and/or Down arrow **1250**. Max Ventilation Limit block **1434** displays a percentage value that can be adjusted up and/or down, as desired, using Up arrow **1250** and/or Down arrow **1250**. In some instances, HVAC controller **20** may display text **1436**, informing the installer that their settings satisfy (or do not satisfy) one or more standardized requirements or guidelines, such as the ASHRAE 62.2 standard.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1430**, a first setup parameter may be a ventilation level, and the first descriptive text may be the text “Ventilation Level” displayed immediately above Ventilation Level block **1432**. A second setup parameter may be the ventilation rate, and the second descriptive text may be the text “Max Ventilation Limit” displayed immediately above Max Ventilation Limit block **1434**. These related parameters may be organized into a common setup category and displayed on the same screen **1430**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1438**, as shown in FIG. **155**. Screen **1438** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to ventilation fan action.

Screen **1438** may include one or more of a Ventilation Forces Fan On button **1440** and a Ventilate Independent of Fan button **1442**. In some HVAC installations, for example, it may be beneficial for the furnace blower motor (fan) to run when the air exchanger operates. In some installations, the air exchanger may function properly without requiring the furnace blower motor to run. The installer may press the appropriate button.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1444**, as shown in FIG. **156**. Screen **1444** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to whether to ventilate upon high humidity. Screen **1444** may include one or more of an Enabled button **1446** and a Disabled button **1448**. The installer may press the appropriate button.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1450**, as shown in FIG. **157**. Screen **1450** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to replacement reminders. Screen **1450** may include one or more of a Furnace Filter block **1452**, a Humidifier Pad block **1454** and a UV lamp block **1456**. It will be recognized that these are merely illustrative, as more or fewer replacement reminders may be incorporated into HVAC controller **20**.

In the illustrative example shown, Furnace Filter block **1452** may display a time period such as a number of runtime days that should elapse before HVAC controller **20** provides the user with a reminder to replace the furnace filter screen as previously shown with respect to screen **92** (FIG. **10**). Up arrow **1250** and/or Down arrow **1252** may be used to increase or decrease the displayed value. Humidifier Pad block **1454** may display a time period such as a number of calendar days that should elapse before HVAC controller **20** provides the user with a reminder to replace the humidifier pad. UV lamp block **1456** may display a time period such as a number of years that should elapse before HVAC controller **20** provides the user with a reminder to replace the UV lamp.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1450**, a first setup parameter may be a replacement period for a furnace filter, and the first descriptive text may be the text “Furnace Filter” displayed immediately above Furnace Filter block **1452**. A second setup parameter may be a replacement period for an humidifier pad, and the second descriptive text may be the

text “Humidifier Pad” displayed immediately above Humidifier Pad block **1454**. These related parameters may be organized into a common setup category and displayed on the same screen **1450**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1458**, as shown in FIG. **158**. Screen **1458** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to furnace filter run time. Screen **1458** may include a Count Heat and Cool Run Time button **1460** and an Only Count Cool Run Time button **1462**. In some cases, the installer may want to count both heating time and cooling time towards furnace filter replacement timing, and thus may press Count Heat and Cool Run Time button **1460**. In some instances, the installer may only want to count cooling time, and thus may press Only Count Cool Run Time button **1462**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1464**, as shown in FIG. **159**. Screen **1464** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to a number of schedule periods per day. In some cases, the installer may want HVAC controller **20** to operate in accordance with four time periods per day, sometimes known as the Wake period, the Leave period, the Return period and the Sleep period, and thus may press a Four Periods Per Day button **1468**. In some instances, such as if the space is occupied during the day every day, the installer may want HVAC controller **20** to only use the Wake period and the Sleep period, and thus may press a Two Periods Per Day button **1466**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1470**, as shown in FIG. **160**. Screen **1470** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to temperature range stops. Screen **1470** may include one or more of a Maximum Heat Setpoint block **1472** and a Minimum Cool Setpoint block **1474**.

51

Maximum Heat Setpoint block **1472** may display a temperature value that limits how high a user may raise a heating temperature set point. Up arrow **1250** and/or Down arrow **1252** may be used to adjust this value, as desired. Minimum Cool Setpoint block **1474** may display a temperature value that limits how low a user may drop a cooling temperature set point. Up arrow **1250** and/or Down arrow **1252** may be used to adjust this value, as desired.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1470**, a first setup parameter may be a maximum heat set point, and the first descriptive text may be the text “Maximum Heat Setpoint” displayed immediately above Maximum Heat Setpoint block **1472**. A second setup parameter may be a minimum cool set point, and the second descriptive text may be the text “Minimum Cool Setpoint” displayed immediately above Minimum Cool Setpoint block **1474**. These related parameters may be organized into a common setup category and displayed on the same screen **1470**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1476**, as shown in FIG. **161**. Screen **1476** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to minimum off times. Screen **1476** may include one or more of a Non-Compressor Stages block **1478** and a Compressor Stages block **1480**. Each of Non-Compressor Stages block **1478** and Compressor Stages block **1480** may display a value that can be increased or decreased, as desired, using Up arrow **1250** and/or Down arrow **1252**.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1476**, a first setup parameter may be a non-compressor minimum off time, and the first descriptive text may be the text “Non-Compressor Stages” displayed immediately above Non-Compressor Stages block **1478**. A second setup parameter may be a compressor minimum off time, and the second descriptive text may be the text “Compressor Stages” displayed immediately above Minimum Cool Setpoint block **1474**. These related parameters may be organized into a common setup category and displayed on the same screen **1476**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1482**, as shown in FIG. **162**. Screen **1482** may include banner **1228**,

52

which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to minimum on times. Screen **1482** may include one or more of Non-Compressor Stages block **1478** and Compressor Stages block **1480**, each of which may display a value that can be increased or decreased, as desired, using Up arrow **1250** and/or Down arrow **1252**.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1482**, a first setup parameter may be a non-compressor minimum on time, and the first descriptive text may be the text “Non-Compressor Stages” displayed immediately above Non-Compressor Stages block **1478**. A second setup parameter may be a compressor stages minimum on time, and the second descriptive text may be the text “Compressor Stages” displayed immediately above Compressor Stages block **1478**. These related parameters may be organized into a common setup category and displayed on the same screen **1482**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1484**, as shown in FIG. **163**. Screen **1484** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to extended fan on times. Screen **1484** may include one or more of an Extended Heat Time block **1486** and an Extended Cool Time block **1488**. Each of Extended Heat Time block **1486** and Extended Cool Time block **1488** may display a value that can be increased or decreased, as desired, using Up arrow **1250** and/or Down arrow **1252**.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1476**, a first setup parameter may be an extended heating fan time, and the first descriptive text may be the text “Extended Time in Heat” displayed immediately above Extended Heat Time block **1486**. A second setup parameter may be an extended cooling fan time, and the second descriptive text may be the text “Extended Time in Cool” displayed immediately above Extended Cool Time block **1488**. These related parameters may be organized into a common setup category and displayed on the same screen **1484**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1490**, as shown in FIG. **164**. Screen **1490** may include banner **1228**, which provides the installer with an indication of menu loca-

tion and in this case informs the installer that they are to provide information pertaining to heating control settings. In some cases, these control settings may influence parameters used in a PID (Proportional-Integral-Derivative) and/or other control. Screen **1490** includes a Less Aggressive button **1492**, a Standard button **1494** and a More Aggressive button **1496**. The installer may influence the performance of HVAC controller **20** by pressing one of these buttons.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1498**, as shown in FIG. **165**. Screen **1498** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to cooling control settings. In some cases, these control settings may influence parameters used in a PID (Proportional-Integral-Derivative) and/or other control. Screen **1498** includes Less Aggressive button **1492**, Standard button **1494** and More Aggressive button **1496**. The installer may influence the performance of HVAC controller **20** by pressing one of these buttons.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1500**, as shown in FIG. **166**. Screen **1500** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide information pertaining to display offsets. In some cases, the installer may want to have HVAC controller **20** display or otherwise operate in accordance with temperature values that are adjusted, or offset, from the detected temperatures.

Screen **1500** may include one or more of an Indoor Temperature block **1502**, an Outdoor Temperature block **1504** and an Indoor Humidity block **1506**. Indoor Temperature block **1502** may display an offset value in degrees that can be adjusted using Up arrow **1250** and/or Down arrow **1252**, as desired. Outdoor Temperature block **1504** may display an offset value in degrees that can be adjusted using Up arrow **1250** and/or Down arrow **1252**, as desired. Indoor Humidity block **1506** may display an offset value in percentage that can be adjusted using Up arrow **1250** and/or Down arrow **1252**, as desired.

As noted above, HVAC controller **20** may be considered as displaying a first setup parameter in conjunction with a first descriptive text and a second, possibly related, setup parameter in conjunction with a second descriptive text. For example, and with respect to screen **1500**, a first setup parameter may be an indoor temperature offset, and the first descriptive text may be the text “Indoor Temperature” displayed immediately above Indoor Temperature block **1502**. A second setup parameter may be an outdoor temperature offset, and the second descriptive text may be the text “Outdoor

Temperature” displayed immediately above Outdoor Temperature block **1504**. A third setup parameter may be an indoor humidity offset, and a third descriptive text may be the text “Indoor Humidity” displayed immediately above Indoor Humidity block **1506**. These related parameters may be organized into a common setup category and displayed on the same screen **1500**.

Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1508**, as shown in FIG. **167**. Screen **1508** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide dealer information. Screen **1508** may include a Dealer Name button **1510** and a Dealer Phone Number button **1512**. Pressing Dealer Name button **1510**, for example, may cause HVAC controller **20** to display an illustrative screen **1514**, as shown in FIG. **168**. Screen **1514** provides a touch-sensitive QWERTY keyboard that the user may use to enter the dealer name. Once the dealer name has been typed, pressing Done button **1516** may cause HVAC controller **20** to save the new name as well as to revert to screen **1508** (FIG. **167**). A similar procedure may be used to enter the dealer’s telephone number by touching Dealer Phone Number button **1512**.

Referring briefly to FIG. **167**, Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC controller **20** to progress to a subsequent screen within the Create Setup menu.

In some cases, pressing Next button **1236** may cause HVAC controller **20** to display an illustrative screen **1518**, as shown in FIG. **169**. Screen **1518** may include banner **1228**, which provides the installer with an indication of menu location and in this case informs the installer that they are to provide additional dealer information. Screen **1518** may include a Dealer E-Mail button **1520** and a Dealer Website button **1522**. Pressing Dealer E-Mail button **1520**, for example, may cause HVAC controller **20** to display an illustrative screen **1524**, as shown in FIG. **170**. Screen **1524** provides a touch-sensitive QWERTY keyboard that the user may use to enter the dealer’s email address. Once the dealer email address has been typed, pressing Done button **1526** may cause HVAC controller **20** to save the email address as well as to revert to screen **1518** (FIG. **169**). A similar procedure may be used to enter the dealer’s website by pressing Dealer Website button **1522**.

Referring briefly to FIG. **169**, Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options. Done button **1234**, if pressed, may cause HVAC controller **20** to exit the installer setup process and revert to a previous screen such as screen **1212** (FIG. **125**) while Next button **1236** may cause HVAC con-

55

troller 20 to progress to a subsequent screen within the Create Setup menu, or to revert to the first screen within the Create Setup menu.

Referring briefly to FIG. 125, pressing View/Edit Current Installer Setup button 1214 may cause HVAC controller 20 to display an illustrative screen 1528, as shown in FIG. 171. Screen 1528 may include navigational bar 1228, which provides the installer with an indication of menu location. Screen 1528 may provide information pertaining to a number of settings, which may include more information than can be displayed at one time, and thus may include Up button 1270 and Down button 1272 so that the installer can scroll up and/or down through the displayed settings and settings categories.

As illustrated, screen 1528 explicitly shows a System Type button 1530, a Humidification button 1532 and a Dehumidification button 1540. Humidification button 1532 has been pressed to expand the sub-headings under humidification, as evidenced by the down arrow displayed within Humidification button 1532. The sub-headings include a Humidity Sensor button 1534, an Equipment Type button 1536 and a Control Strategy button 1538. It can be seen that some of this information has not yet been entered into HVAC controller 20. A Done button 1542, if pressed, may cause HVAC controller 20 to revert to a previous screen such as screen 1212 (FIG. 125). In some cases, the installer may touch one of the buttons, such as Equipment Type button 1536, and HVAC controller 20 may open the appropriate menu or menus to enter the desired information. A Back button may then return the installer to screen 1528. This may provide an efficient way for the installer to enter and/or change settings for HVAC controller 20.

Returning briefly to FIG. 125, pressing Installer Test button 1218 may cause HVAC controller 20 to display an illustrative screen 1544, as shown in FIG. 172. Screen 1544 may include banner 1546, which reminds the user that they are at a screen in which they can test cooling stages. Screen 1544 may include one or more of an Off button 1548, a Cool Stage One button 1550 and a Cool Stages One and Two button 1552. The installer may press one or more of these buttons, and then ascertain if the HVAC equipment is responding properly.

Back button 1222 permits the installer to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer test process and revert to a previous screen such as screen 1212 (FIG. 125) while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the Installer Test menu.

In some cases, pressing Next button 1236 may cause HVAC controller 20 to display an illustrative screen 1554, as shown in FIG. 173. Screen 1544 may include banner 1546, which reminds the user that they are at a screen in which they can test fan operation. Screen 1554 may include an Off button 1556 and an On button 1558. The installer may press one or more of these buttons, and then ascertain if the blower motor is responding properly.

Back button 1222 permits the installer to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer test process and revert to a previous screen such as screen 1212 (FIG. 125) while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the Installer Test menu.

In some cases, pressing Next button 1236 may cause HVAC controller 20 to display an illustrative screen 1560, as

56

shown in FIG. 174. Screen 1560 may include banner 1546, which reminds the user that they are at a screen in which they can test heating stages. Screen 1560 may permit more testing options than can be displayed at one time, and when so provided, screen 1560 may include Up button 1270 and Down button 1272 so that the installer can scroll up and/or down through the displayed testing options. Screen 1560 may include, for example, one or more of a Heat Stages One and Two On button 1562, a Heat Stages One, Two and Three On button 1564 and a Heat Stages One, Two, Three and Four On button 1566. The installer may press one or more of these buttons, and then ascertain if the furnace is responding properly.

Back button 1222 permits the installer to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer test process and revert to a previous screen such as screen 1212 (FIG. 125) while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the Installer Test menu.

In some cases, pressing Next button 1236 may cause HVAC controller 20 to display an illustrative screen 1568, as shown in FIG. 175. Screen 1568 may include banner 1546, which reminds the user that they are at a screen in which they can test emergency heating stages. Screen 1568 may permit more testing options than can be displayed at one time, and thus may include Up button 1270 and Down button 1272 so that the installer can scroll up and/or down through the displayed buttons. Screen 1568 may include one or more of an EM Heat Stage One On button 1570, an EM Heat Stages One and Two On button 1572 and a Heat Stages One, Two and Three On button 1574. The installer may press one or more of these buttons, and then ascertain if the furnace is responding properly.

Back button 1222 permits the installer to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer test process and revert to a previous screen such as screen 1212 (FIG. 125) while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the Installer Test menu.

In some cases, pressing Next button 1236 may cause HVAC controller 20 to display an illustrative screen 1576, as shown in FIG. 176. Screen 1576 may include banner 1546, which reminds the user that they are at a screen in which they can test operation of the indoor air quality equipment. Screen 1576 may include one or more of a Humidifier Off button 1578, a Humidifier On button 1580, a Dehumidifier Off button 1582, a Dehumidifier On button 1584, a Ventilator On button 1586 and a Ventilator Off button 1588. The installer may press one or more of these buttons, and then ascertain if the indoor air quality equipment is responding properly.

Back button 1222 permits the installer to revert to a previous screen while Help button 1224 may provide the installer with additional information or guidance pertaining to their options. Done button 1234, if pressed, may cause HVAC controller 20 to exit the installer test process and revert to a previous screen such as screen 1212 (FIG. 125) while Next button 1236 may cause HVAC controller 20 to progress to a subsequent screen within the menu structure.

Returning briefly to FIG. 125, pressing Advanced Options button 1218 may cause HVAC controller 20 to display an illustrative screen 1590, as shown in FIG. 177. Screen 1590 may include Navigational bar 1228, which provides the installer with an indication of where they are within the hier-

57

archical menu. Screen **1590** may include one or more of a Configure Using USB button **1592** and a Restore Factory Defaults button **1594**. Back button **1222** permits the installer to revert to a previous screen while Help button **1224** may provide the installer with additional information or guidance pertaining to their options.

Pressing Restore Factory Defaults button **1594** may cause HVAC controller **20** to display an illustrative screen **1596**, as shown in FIG. **178**. Navigational bar **1228** provides the installer of an indication of where they are within the hierarchical menu structure. Screen **1596** may include an inquiry **1598**, asking the installer if they wish to delete any and all parameter settings in favor of their factory default settings. A Yes button **1600** and a No button **1602** permit the installer to provide their answer. A Cancel button **1604**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1212** (FIG. **125**) or screen **1590** (FIG. **177**).

Returning briefly to FIG. **177**, in some instances HVAC controller **20** may be configured to permit an installer to download a configuration file onto a USB device or other portable storage device so that the configuration file may be uploaded into another HVAC controller. This may make programming an HVAC controller much quicker, rather than having to go through the setup screens as discussed herein. In some cases, pressing Configure Using USB button **1592** may cause HVAC controller **20** display an illustrative screen **1606**, as shown in FIG. **179**.

Screen **1606** includes text **1608**, instructing the installer to insert the USB memory stick or related storage device. The memory stick or related storage device may be inserted into, for example, a compatible data port such as data port **18** (FIG. **1**). A Cancel button **1610**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1590** (FIG. **177**). If the installer inserts the USB device in response to screen **1606**, HVAC controller **20** may display an illustrative screen **1612**, as shown in FIG. **180**. In some cases, with respect to FIG. **177**, controller **20** may display screen **1612** upon insertion of a USB device even if the installer does not press Configure Using USB button **1592**.

Screen **1612** may include a navigation bar **1614** that provides the installer with a reminder of where they are within the USB setup menu. A Previous Menu button **1616**, if pressed, may cause HVAC controller **20** to revert to a previous screen. In some cases, HVAC controller **20** may display a screen (not illustrated) reminding the installer to remove the USB device when appropriate, although this is not required.

In some cases, screen **1612** may provide more option buttons than can be displayed at one time. An Up button **1618** and a Down button **1620** may be used, as desired, to scroll up and/or down through the displayed option buttons. Screen **1612** may include, for example, one or more of a Load Configuration to Thermostat button **1622**, a Save Configuration From Thermostat button **1624**, a Dealer Information button **1626** and a Safely Remove USB Device button **1628**.

In some instances, pressing Load Configuration to Thermostat button **1622** may cause HVAC controller **20** to display an illustrative screen **1630**, shown in FIG. **181**. Navigation bar **1614** provides the installer with a reminder of where they are within the USB setup menu. Screen **1630** may provide a number of configuration buttons including a First Configuration button **1632**, a Second Configuration button **1634**, a Third Configuration button **1636** and a Fourth Configuration button **1638**. As the USB device may include more configurations than can be displayed at one time, screen **1630** may include Up button **1618** and Down button **1620** so that the installer may scroll up and down, as desired.

58

In some instances, the USB device (not illustrated) may include a number of different configurations. In some cases, these configurations may be for different residential and/or light commercial environments but may be for a particular type of thermostat. In some cases, these configurations may also be for different types or models of thermostats. HVAC controller **20** may in some instances only display configurations that are appropriate for the HVAC controller being configured.

The installer may select one of the configurations by pressing the appropriate configuration button such as one of First Configuration button **1632**, Second Configuration button **1634**, Third Configuration button **1636** and Fourth Configuration button **1638**. A View Configuration button **1640** may be pressed in order to obtain more information regarding a particular configuration including, for example, being able to preview a number of the operating parameters included in the selected configuration. These operating parameters may be organized in a hierarchical manner, and may be previewed through a hierarchical menu structure. If the configuration does not fit on the display, HVAC controller **20** may display scroll bars that may be used to scroll through the displayed information. As illustrated, First Configuration button **1632** (labeled ABC.XML) has been selected. Upon pressing View Configuration button **1638**, HVAC controller **20** may display an illustrative screen **1646**, as shown in FIG. **183**.

Screen **1646** includes Navigation bar **1614**, which provides the installer with a reminder of where they are within the USB setup menu. A particular configuration file may include more setup topics than can be displayed at one time, and thus screen **1646** may include Up button **1618** and Down button **1620** so that the installer may scroll up and down, as desired. Screen **1646** may include one or more of a System Setup button **1648**, a System Control Options button **1650**, a Scheduling Options button **1652**, and a Zoning Options **1654**, but are not limited to these. Other possible buttons (not displayed) may include one or more of Display Settings, Calendar Settings, Humidification Settings, Dehumidification Settings, Ventilation Settings, and Service Reminders; as well as things such as various wallpapers for home screens, screen savers, skins, etc., that might be used to customize the look and feel of the display, if desired.

A Show All Values button **1656**, if pressed, may cause HVAC controller **20** to expand each of the options buttons such as System Setup button **1648**, System Control Options button **1650**, Scheduling Options button **1652**, and Zoning Options **1654** and to display each of the parameters and parameter values pertaining to each of the options buttons. A Help button **1658** may provide the installer with additional information, guidance, options and the like. A Done button **1660**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1630** (FIG. **181**).

Returning briefly to FIG. **180**, if the installer presses Load Configuration to Thermostat button **1622** and there are no compatible configuration files on the USB device, HVAC controller **20** may display an illustrative screen **1662**, as shown in FIG. **182**. Screen **1662** may include Navigation bar **1614**, which provides the installer with a reminder of where they are within the USB setup menu. Screen **1662** may include text **1664** informing the installer that there are no compatible configuration files on the USB device. The installer may have to try a different USB device, or perform the setup process manually. An OK button **1666** may cause HVAC controller **20** to revert to a previous screen.

Returning briefly to FIG. **181**, pressing Load button **1644** may cause HVAC controller **20** to upload the selected configuration from the USB device. If the upload is not success-

59

ful, HVAC controller **20** may display a screen (not illustrated) providing an appropriate error message and/or a suggested way to correct the error. If the upload is successful, HVAC controller **20** may display an illustrative screen **1668**, as shown in FIG. **184**. Screen **1668** may include text **1670** informing the installer that the configuration was successfully loaded. An OK button **1672**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1612** (FIG. **180**).

Returning briefly to FIG. **180**, pressing Save Configuration From Thermostat button **1624** may cause HVAC controller **20** to display an illustrative screen **1674**, as shown in FIG. **185**. Screen **1674** provides a touch-sensitive QWERTY keyboard that the installer may use to enter a name for the configuration that will be downloaded from HVAC controller **20** to the USB device (not illustrated). A Done button **1676**, if pressed, may cause HVAC controller **20** to attempt to upload the newly named configuration to the USB device. If the configuration is successfully uploaded, HVAC controller **20** may display an illustrative screen **1678**, as shown in FIG. **186**. Screen **1678** may include text **1680**, informing the installer that the configuration was successfully saved to the USB device. OK button **1672**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1612** (FIG. **180**).

In some instances, a current configuration may be saved as a file on the USB or other external memory device. The name of the current configuration may be used as the file name. It will be appreciated that if there are two or more configurations saved on the USB or other external memory device, each will have a unique configuration name and a corresponding unique file name.

Returning briefly to FIG. **180**, pressing Dealer Information button **1626** may cause HVAC controller **20** to display an illustrative screen **1682**, as shown in FIG. **187**. Screen **1626** may include Navigation bar **1614**, which provides the installer with a reminder of where they are within the USB setup menu. Previous Menu button **1616**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1612** (FIG. **180**). As there may include more options than can be displayed at one time, screen **1682** may include Up button **1618** and Down button **1620** so that the installer may scroll up and down, as desired. Screen **1682** may include, for example, one or more of a Load Dealer Info Into Thermostat button **1684**, a Save Dealer Info From Thermostat button **1686**, a Load Dealer Logo into Thermostat button **1688** and a Safely Remove USB Device button **1690**.

Pressing Load Dealer Info Into Thermostat button **1684** may cause HVAC controller **20** to display an illustrative screen **1692**, as shown in FIG. **188**. Screen **1692** may include Navigation bar **1614**, which provides the installer with a reminder of where they are within the USB setup menu. As there may include more dealer information files than can be displayed at one time, screen **1692** may include Up button **1618** and Down button **1620** so that the installer may scroll up and down, as desired.

Screen **1692** may provide a number of dealer information buttons including a First Dealer File button **1694**, a Second Dealer File button **1696**, a Third Dealer File button **1698** and a Fourth Dealer File button **1700**. The installer may select one of the dealer information files by pressing the appropriate button such as one of First Dealer File button **1694**, Second Dealer File button **1696**, Third Dealer File button **1698** and Fourth Dealer File button **1700**.

A Preview Dealer Info button **1702** may be pressed in order to obtain more information regarding a particular configuration. A Cancel button **1704** may be pressed to return to a previous screen such as screen **1682** (FIG. **187**). Pressing a

60

Load button **1706** may cause HVAC controller **20** to attempt to upload the selected dealer information file from the USB device. In some cases, the file may be corrupted or may otherwise not be useable.

If the file is corrupt or otherwise not compatible with HVAC controller **20**, and the installer presses either of Preview Dealer Info button **1702** or Load button **1706**, HVAC controller **20** may display an illustrative screen **1708**, as shown in FIG. **189**. Screen **1708** may include text **1710**, informing the installer that the selected dealer information file is corrupted or otherwise not compatible with HVAC controller **20**. It should be noted that HVAC controller **20** may display a similar screen if, with respect to screen **1630** (FIG. **181**), the selected configuration file is corrupted or otherwise not compatible with HVAC controller **20**. Pressing OK button **1672** may cause HVAC controller **20** to revert to a previous screen such as screen **1692** (FIG. **188**).

Returning briefly to FIG. **188**, and if the selected dealer information file is intact, HVAC controller **20** may display an illustrative screen **1712**, as shown in FIG. **190**. Navigation bar **1614** may provide the installer with a reminder of where they are within the USB setup menu. Screen **1708** may include text **1714**, providing contact information corresponding to the selected dealer information file. A Return button **1716**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1692** (FIG. **188**).

Pressing Load button **1706** (FIG. **188**), assuming the selected dealer information file is correct and the selected file is successfully uploaded from the USB device, HVAC controller **20** may display an illustrative screen **1718**, shown in FIG. **191**. Navigation bar **1614** may provide the installer with a reminder of where they are within the USB setup menu. Screen **1718** may display the successfully uploaded dealer information, including one or more of text **1714** and/or a dealer logo **1720**. A Done button **1722**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1682** (FIG. **187**).

Returning briefly to FIG. **187**, pressing Save Dealer Info From Thermostat button **1686** may cause HVAC controller **20** to display an illustrative screen **1724** as shown in FIG. **192**, which provides a touch-sensitive QWERTY keyboard that the installer may use to enter a name for the dealer information file to be downloaded from HVAC controller **20** to the USB device (not illustrated).

A Done button **1726**, if pressed, may cause HVAC controller **20** to attempt to upload the newly named dealer information file to the USB device. If the configuration is successfully uploaded, HVAC controller **20** may display an illustrative screen **1728**, as shown in FIG. **193**. Navigation bar **1614** may provide the installer with a reminder of where they are within the USB setup menu. Screen **1728** may include text **1730**, informing the installer that the dealer information file was successfully saved to the USB device. OK button **1672**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1682** (FIG. **187**).

Returning briefly to FIG. **187**, pressing Load Dealer Logo Into Thermostat button **1688** may cause HVAC controller **20** to display an illustrative screen **1732**, as shown in FIG. **194**. Because there may be more dealer logo files than can be displayed at one time, screen **1732** may include Up button **1618** and Down arrow **1620**, so that the installer may scroll up and/or down through the listed dealer logo files, if desired. Screen **1732** may, as illustrated, include a First Dealer Logo file button **1734**, a Second Dealer Logo file button **1736** and a Third Dealer Logo button **1738**.

After selecting a dealer logo file by pressing the appropriate button, the installer may preview the logo by pressing a

61

View Dealer Logo button **1740**. Cancel button **1704** may be pressed to return to a previous screen such as screen **1682** (FIG. **187**). Load button **1706** may be pressed to attempt to upload the selected dealer logo file from the USB device to HVAC controller **20**. If the attempt is successful, HVAC controller **20** may display a screen (not illustrated) similar to screen **1668** (FIG. **184**). If the dealer logo file is corrupted, as may be discovered when the installer attempts to preview the logo and/or tries to upload the dealer logo file, HVAC controller **20** may display a screen (not illustrated) similar to screen **1708** (FIG. **189**).

Returning briefly to FIG. **187**, pressing Safely Remove USB Device button **1690** may cause HVAC controller **20** to display an illustrative screen **1742**, as shown in FIG. **195**. Navigation bar **1614** may provide the installer with a reminder of where they are within the USB setup menu. Screen **1742** may include text **1744** informing the installer that it is safe to remove the USB device. Cancel button **1704**, if pressed, may cause HVAC controller **20** to revert to a previous screen such as screen **1612** (FIG. **180**).

The disclosure should not be considered limited to the particular examples described above, but rather should be understood to cover all aspects of the invention as set out in the attached claims. Various modifications, equivalent processes, as well as numerous structures to which the invention can be applicable will be readily apparent to those of skill in the art upon review of the instant specification.

What is claimed is:

1. An HVAC controller configured to control one or more components of an HVAC system, the HVAC controller comprising:

a user interface including display;
a controller in communication with the user interface;
the controller is programmed to operate an algorithm that at least partially controls one or more components of an HVAC system;

the controller is programmed to display two or more separate screens on the display of the user interface in response to user interaction with the touch screen display, including a home screen, wherein the home screen is automatically displayed after no user interaction is sensed for a period of time, the home screen includes a first display region and a second display region, wherein the first display region displays a first set of information and the second display region displays a second set of information; and

the controller is programmed to detect an occurrence of one or more system events, and if detected, the controller defines at least part of the second display region as an information button on the touch screen display while still displaying the first set of information in the first display region of the home screen, wherein when the information button is activated, more information is displayed on the display that relates to the one or more detected system events.

2. The HVAC controller of claim **1**, wherein the one or more messages include an informational message.

3. The HVAC controller of claim **1**, wherein the one or more messages include an equipment message.

4. The HVAC controller of claim **3**, wherein the equipment message informs a user that one or more components of the HVAC system is malfunctioning.

5. The HVAC controller of claim **3**, wherein the equipment message includes an equipment maintenance message.

62

6. The HVAC controller of claim **5**, wherein the equipment maintenance message pertains to one or more of an air filter change, an air filter cleaning, a humidifier pad change and a UV lamp replacement.

7. The HVAC controller of claim **1**, wherein the second set of information includes one or more of a date, a time, an equipment status and an outdoor weather parameter.

8. The HVAC controller of claim **1**, wherein the first set of information includes one or more of a current indoor temperature, a temperature set point, an indoor humidity reading and schedule information.

9. The HVAC controller of claim **1**, wherein the more information is displayed, at least in part, in the first region of the touch screen display.

10. The HVAC controller of claim **1**, wherein when the information button is touched, a notification screen is displayed which provides the more information that relates to the one or more detected system events.

11. The HVAC controller of claim **10**, wherein the notification screen includes a scroll feature that allows a user to scroll through one or more messages.

12. The HVAC controller of claim **1**, wherein the controller is further programmed to display a menu driven user interface on the touch screen display that includes the home screen and at least one another screen.

13. An HVAC controller configured to control one or more components of an HVAC system, the HVAC controller comprising:

a touch screen display;
a controller in communication with the touch screen display;

the controller programmed to operate an algorithm that at least partially controls one or more components of an HVAC system;

the controller is programmed to display two or more separate screens on the touch screen display in response to user interaction with the touch screen display, including a home screen, wherein the home screen is automatically displayed after no user interaction is sensed for a period of time; and

the controller is programmed to detect an occurrence of one or more system events, and if detected, displays an information button, wherein when the information button is touched, the controller displays additional information on the touch screen display that is related to the detected system event.

14. The HVAC controller of claim **13**, wherein the controller displays a plurality of parameters on the home screen, and wherein the information button replaces at least one of the plurality of parameters on the home screen.

15. The HVAC controller of claim **14**, wherein the at least one of the plurality of parameters that are replaced by the information button on the home screen includes one or more of a date, a time, an equipment status and an outdoor weather parameter.

16. The HVAC controller of claim **13**, wherein the information button includes a message that describes the detected one or more system events.

17. The HVAC controller of claim **13**, wherein when the information button is touched, the controller displays the additional information on a screen that is separate from the home screen.

18. A method for alerting a user of a thermostat to a system event, comprising:

displaying one or more parameters on a home screen of a display of a thermostat, wherein the home screen is

63

automatically displayed after no user interaction with the thermostat is sensed for a period of time; and detecting a system event, and in response to the detection of the system event, displaying information including an information button in place of at least part of the home screen, wherein when the information button is activated by a user, displaying further information on the display of the thermostat.

19. The method of claim **18**, wherein the information that is displayed in response to the detection of the system event includes a message that describes the detected system event.

20. The method of claim **18**, wherein the information that is displayed in response to the detection of the system event replaces at least one of the one or more parameters on the home screen.

21. The method of claim **18**, wherein when the information button is activated by the user, the further information is displayed on a screen that is separate from the home screen.

22. The method of claim **18**, wherein the further information includes information related to a dealer.

64

23. An HVAC controller configured to control one or more components of an HVAC system, the HVAC controller comprising:

a display; and

a controller in communication with the display, the controller programmed to operate an algorithm that at least partially controls one or more components of an HVAC system, and further programmed to:

display one or more parameters on a home screen of the display, wherein the home screen is automatically displayed after no user interaction with the HVAC controller is sensed for a period of time; and

detect a system event, and in response to the detection of the system event, display information including an information button in place of at least part of the home screen, wherein when the information button is activated by a user, display further information on the display.

* * * * *